The Builder.

VOL. XXXVI. No. 1840. SATURDAY, MAY 11, 1878

ILLUSTRATIONS.

Wrought-iron Gates, at the Paris Exhibition.—Designed by Mr. Edward M. Barry, R.A., Architect 486
Oxford University Observatory.—Mr. Charles Barry, F.S.A., Architect 487
Plan and Section of Oxford Observatory 489

CONTENTS.

The Royal Academy Exhibition 473
The Screwing up at St. Alban's Abbey 475
Dutch Drawings at the Burlington Fine Arts Club 475
Art and Mind: Liverpool Architectural Society 476
Royal Institute of British Architects 476
New York Household Taste 477
How the Public Money goes 478
Sanitary and Social Notes in and about Dublin: the South City and Environs 479
Short "Quantities" 479
Architecture at the Royal Academy 480
Lambeth Palace: Visit of the Architectural Association 481
Roman Remains at Itchen Abbas 482
Wrought-iron Gates, Paris Exhibition 484
The Reforms in House-Construction demanded by Sanitary Science 482
Healthy Houses 484
Oxford University Observatory 484
Factory Chimney Construction 490
Three Indian Railway Bridges: the Institution of Civil Engineers 492
Keble College, Oxford 493
Alleged Insanitary Flats 493
Paris and its Exhibition 494
Insanitary Property at Liverpool 494
Obituary 494
The Work at St. Alban's Abbey 494
District Surveyorships: Metropolitan Board of Works 495
The School Board and Sanitary Matters 495
River Purification 495
New Roman Catholic Ladies' College at Camberwell 495
Model Pipe-laying 495
The Question of Oak or Chestnut in Building Operations 495
The Artisans', Labourers', and General Dwellings Company, Limited 496
Buckingham Water-Gate 496
"The Plaint of a Poor Mechanic" 496
Reading Town-hall Competition 496
Contract to Sell: Hussey v. Horne Payne 496
Architects' Certificates: Sparrow v. Hill 496
Books recieved: The Crace Collection; Variorum 496
Miscellanea 497

The Royal Academy Exhibition.

IT seems to be the talk that the Academy Exhibition this year is a bad one, but we confess we hardly understand why. Public opinion is very capricious in these matters. It is true that there is no great picture this year,—none that forms the unquestionable central point of the exhibition. It is true, also, that more terrible things than ever have been placed on the line by R.A.s who would do more wisely to repose upon their laurels; and one worse than unfortunate effort has formed such a centre of ridicule that it would have been a kindness on the part of any friend of the artist to have surreptitiously removed it before the exhibition opened: it is, at all events, to be hoped that this *reductio ad absurdum* of the results of leaving unlimited licence to the privileged to hang their works will lead to some reform. But in spite of these negative and positive deficiencies, there are a great many good and interesting pictures, some of them by painters who are new to fame, and are making rapid progress in their art; and this is a good sign for the future of the Academy. There are also a good many works that are out of the hackneyed line in regard to choice of subject, and present something like new ideas.

We will notice some of the principal works, taking the artists as their names come in the order of hanging. Mr. Millais and Mr. Leslie have the places of honour in Gallery I. The "Princes in the Tower" (21) of the former artist illustrates an incident in English history which has an undying attraction, from its peculiarly tragic pathos. As usual, Mr. Millais is realistic, it may be said prosaic, in his rendering; but then, on the other hand, he is not (and we may say could never be) theatrical, which is matter for deep thankfulness. There is a painful interest in the very simplicity of the picture: the two poor children, with a look of bewilderment and not knowing what to do with themselves, are discovered aimlessly pacing a landing of the Tower Stairs, hand in hand; one of them looking merely blank, the other fearful and suspicious at sight of a figure whose shadow only is seen in the picture. There is nothing to remark upon in the execution different from the artist's usual well-known style: indeed, the painting is so unobtrusive in every way that one does not at first recognise how much it assists in bringing the reality of the story home to us. Mr. Leslie's painting, "Home, Sweet Home" (64), does not quite explain whether the interesting group of girls who compose it are already "home," or are only singing of it in anticipation; one sits at an old-fashioned piano, the others stand round; their dresses form, as usual with the artist, a beautiful "colour-symphony"; their characters are well discriminated, but all are a little dreamy and unreal, except the lassie leaning on a chair on the left; she has the most life in her. The picture is not so bright and taking as some of Mr. Leslie's previous works, but it is sure to be much liked. We complain that the young lady's hands are not playing on the keyboard; rarely do we see hands drawn under these circumstances as they really appear; they are nearly always limp in action and too close down on the keyboard. Mr. John Reid's "County Cricket Match, Sussex" (77), is a clever and humorous treatment of a thoroughly English subject. The door is flanked by two Eastern subjects; Mr. V. Prinsep's "Study of a Kashmiree Nautch Girl" and Mr. Poynter's "Zenobia captive" (43): the latter is a copper-coloured, richly caparisoned, handsome woman, whose arm is very finely drawn and modelled, and whose costume combines with the marble background to produce a sumptuous decorative effect. Mr. Prinsep's more important effort must be looked for on the other side of the wall in Gallery II., the portrait of "Martaba" (167), another Nautch girl, in which the artist seems to have somewhat adopted not only an Eastern subject, but an Eastern style of art, for his picture is certainly not like the work of a European artist, and is more curious than beautiful. Mr. Poynter's portrait of "Mrs. Langtry" (155) is a central piece in Gallery II., a half-length again in a rather hard decorative style, with much attention bestowed on the dress. Odious as comparisons are said to be, it is impossible to avoid them, when two leading artists paint the same lady; and besides, the comparison with Mr. Millais's, "A Jersey Lily," in Gallery III., points a moral. We have often suggested that "decorative" portraiture, however brilliant, was beside the highest objects of portrait-painting; we regretted last year that Mr. Poynter, in one of his portraits (Mrs. Milman), had allowed the accessories to get so much the upper hand of the personality of the sitter: is not the criticism justified by the present example? His "Mrs. Langtry" is a picture producing a brilliant effect; Mr. Millais's portrait hardly affects us as a picture: it is a real, breathing, flesh-and-blood woman, whom we are disposed to fall in love with; and certainly that is a greater success in portraiture than one which sets us looking at the combinations and accessories; even as a woman who is beautiful, independently of adornment, is better than one who only strikes us as artistically dressed.

Gallery II. contains what is perhaps the most powerful painting in the exhibition, Mr. Brett's "Cornish Lions" (105), certain rocks so named from their outlines, and which are seen across the angle of a bay from the shore. The painting of the effect of light and shadow on the cliffs in very strong sunlight is what we have had before from the artist, but the foreground, showing the beach and the incoming sea, is almost startling in its reality; we are almost persuaded we hear the sound of the waves. As we look more at the details of the painting, we realise what labour must have gone to the attainment of this remarkable reproduction of nature, more especially in the minutely-studied drawing of the breaking waves, and their reflected and transmitted lights. There is something absurd in the fact that the painter of this work is not even an Associate, considering the style of landscape painting which has not long since found favour in the eyes of the electing body. The other large work in this room is Mr. Long's "Interior of an Egyptian God-manufactory" (129), as we may call it, where a group of young women are engaged in modelling and painting cat-headed figures and other characteristic objects of Egyptian cult. A black attendant holds a frightened-looking white cat for one of the artists to model from. Considering the known veneration of the Egyptians for cats, as well as the very unrealistic character of their figures, we should think this a most improbable incident. The subject gives occasion for a great deal of painting of Egyptain "properties"; but the best thing in the picture is the drawing of the back of the seated figure in the centre. We look with more interest and sympathy at Mr. Hodgson's admirably humorous "Eastern Question" (97), an attempted conversation between Orientals and English sailors, in some place of entertainment; at least, one sailor is attempting to make himself understood; the other, a regular jack-tar, obviously considers it absurd to think of getting anything out of fellows of such outlandish dress and "lingo." Mr. Armitage's "Beati Possidentes," which balances this, the "possessor" being the fortunate purchaser of a rare beetle at an entomological sale, has excellent qualities and a vein of original humour.

Mr. Leighton's "Nausicaa" (145) hangs a little on one side in this gallery. It is a charming work,—a damsel, with white dress and green mantle over her shoulders, whose fine, full figure is quite evident in its development beneath her drapery, which also is painted with singular beauty and care. There seems, however, no reason for calling the figure Nausicaa more than by any other name, and she is not dignified and aristocratic enough for the character. But Mr. Leighton's best picture of the year is in Gallery III., "Winding the Skein" (302), an operation which is carried on by two classic girls of a far-away period. The elder, seated, has a somewhat mannered and expressionless face, and exquisite arms, hands, and feet, of that peculiarly waxen look which this painter affects, and which is certainly not nature, though it is very charming in its way. The real interest and originality of the painting

lie in the smaller figure of the young girl standing up. Her bright, characteristic face has a thoroughly human interest, and her figure is beautifully drawn and studied, and has a kind of naïve, piquant grace quite unusual.

After Mr. Leighton's work, the most important painting in Gallery IV. is Mr. Alma Tadema's "Sculptor's Model" (255). This is a realistic studio scene, though the canvas is nearly filled by the figure of the model, who stands on a table, facing the spectator, grasping with one hand an upright branch of some kind of tree, with which she steadies herself, while a turn of the fillet that is round her head, hitched also round the branch, helps to keep the whole figure in position. The Sculptor stands on the floor behind, directing the "posing." As a matter of flesh-painting, the picture is very fine,—*cela va sans dire*; but the figure is not overwell drawn, and is not beautiful, being starved and angular at the hips, and something thick in the leg below the knee;—neither, certainly, admirable points. Hence the picture seems a failure, since we hardly want mere nudity, except as the means of unveiling to us beauty. Compare this with Lefebvre's "Chloe," which we mentioned the other day, and the difference in artistic value is obvious at once. Mr. Tadema's smaller work, "A Love Missile" (256), is nearly in his best way,—not quite; but, to say "nearly," is saying a great deal in its favour.

At the top of the room is Mr. Calderon's scene (190) of the carting away of some favoured nuns, by the kind forewarning of "your friend, Oliver Cromwell," to escape the scene of the demolition of the convent by the Parliamentary troops. Nuns in pictures are always pretty, and these are no exception, but the work does not impress us with a feeling of reality. Mr. Calderon's most taking work is the half-length of a fine handsome girl carrying a flower-basket filled with "La Gloire de Dijon" (629), "herself a fairer flower"; and his portrait of a little girl preparing an *al fresco* tea out of doors (458) is very pretty and successful. Mr. Britton Rivière has made a thoroughly good hit in his picture of lions walking by moonlight up the stairs of the ruined Palace of Persepolis; and in a quite different way his study of geese, "An anxious Moment" (392), in the next room, is admirable; in fact, nothing better could be done of its kind. Mr. Peter Graham shows signs of being himself again in his fine landscape called "Wandering Shadows" (267), the glint of the sunlight on the hill to the left is very finely given: it is balanced, but not equally, by a large landscape of Mr. Vicat Cole's, "The Alps at Rosenlaui" (268), of which the distance is the finest part; the foreground is hard and somewhat conventional. Mr. Graham's smaller work, "Gusty Weather" (997), in the Lecture Room, should be looked at.

Mr. Frith, R.A., exhibits in this room a remarkable series of pictures entitled "The Road to Ruin" (291-5), illustrating the fatal effects of a passion for gambling. The pictures have been so fully described in the daily papers that we need not go over the ground again. Suffice it to say that they contain much able and carefully-studied work, display a large amount of character (especially in the group of bettingmen in the second subject, "Ascot,") and tell the story clearly and well. Mr. Orchardson has here a very clever thing in his peculiar and very original style, "A Social Eddy,—Left by the Tide" (308), the title referring to a young lady at a dance of the Jane Austen period, who has been left without a partner, while the rest of the party are defiling through a door into the ball-room. The incident is very slight, no doubt, but the whole thing is completely in keeping; it is a bit of the humour of art, and the execution is very good indeed, better than in "Queen of the Swords," last year, though there is not so much spirit and "go" in it as in that very effective performance. Mr. Orchardson is an artist who has made his own style, and made a success in it. Mr. Marks's picture in this room must not be forgotten, "Convocation" (286); it is one of those humourous bird-studies which have been favourites with the painter ever since the great success of "St. Francis Preaching to the Birds." The *dramatis personæ* in this case are some solemn-looking marabout cranes; as usual, there is a lurking satire on things human in the expressions of the birds.

The central place in Gallery IV. is occupied by Mr. Yeames's large work, the examination of the family of a Royalist household by a Parliamentary party of soldiers: the question, "And when did you last see your father?" (329) being put to a small boy who stands on a footstool, to bring his face better above the line of the table that is between him and his questioners. The painting tells its story forcibly; the simplicity of the child, the anxious faces of his elder relatives, and the varied but all alike rough and sombre expressions of the Parliamentary party, form an effective and pathetic contrast. A tall steeple-hatted figure, seated among the Parliament men, recalls Scott's "Corporal Humgudgeon," and was perhaps suggested by the description of that worthy in Woodstock. The same room contains Mr. Watts's principal contribution "Britomart and her Nurse" (379) from Spenser's "Faerie Queene"; not, however, treated in accordance with the poem, for Britomart's vision in the magic glass was seen when she was alone, and only told to her nurse afterwards, when she wanted consolation: here the two occasions are combined; but in so visionary a subject correctness is of little consequence. The painting is rich in colour, and very fine in design; the two figures are seated on the ground, the "warlike maid" facing the spectator, and with her back to the magic imagery; an emblematical lily springs before her in the front of the picture, serving the additional purpose of heightening the richness of colour in the draperies of the two figures. The face of Britomart does not quite satisfy one's ideal; but it is a remarkable work. The same painter has in this room a good portrait of Mr. Blumenthal, the composer. We also find here Mr. Hook's principal contribution, "The Coral Fisher, Amalfi" (351); the artist has gone to southern shores for his figures and scenery (both very effective), but the sea,—the old Hook sea,—follows him there, and is welcome for old association sake, though one may think that there should be some more marked distinction between the tone of northern and southern seas. Mr. Boughton's painting, "Green Leaves among the Sere" (374), gives more prominence to the figures than has been the case in much of his work lately; they are a group of melancholy-looking women, whose expression of past sorrow is contrasted with the youth and life of the children; there is considerable pathos in the work, but perhaps a little far-fetched. Mrs. Ward has a good subject in the "Incident of Burns and Jessy Sewars" (380), and there is considerable character in the figure of the poet reflecting on his verses with his pen in his mouth; the action, by the way, he mentions in one of his letters to have been a usual one with him when composing; putting it in his own characteristic way, "I'm a devil of a crib-biter."

Mr. Frank Holl is one of those who has made what is called a "hit" (there are a good many hits this year) in his "Newgate: committed for Trial" (423), where an interesting-looking prisoner, whom we may reasonably hope is proved to be innocent at last, is interviewed by his wife and children. The point of the picture lies in the contrast between the tearful reality of sorrow in this group and the low cunning and merely selfish interest of the fellow who also addresses his better half (worse she could hardly be), the cold impassivity of the official forming a foil to both groups. The thing is carefully worked out, and contains less of the mere "agony" element than is usual in this artist's rather sensational scenes. Mr. Long has been most successful in his portrait of Mr. Irving, as the "Duke of Gloucester" (472); the likeness is exceptionally good. Near this hangs Mr. Millais's landscape, "St. Martin's: Summer" (465); hardly a success, considering what has preceded it. Whatever may be popularly said, this artist is so very much greater as a figure painter than as a landscape painter, that it is almost to be regretted that he should step out of his real path. Certainly we have had some remarkable achievements in landscape from him, remarkable in certain qualities, which, however, the present one can hardly be said to possess to any marked extent. Mr. Gow, a painter who is coming to the front, shows admirable humour, and some very good painting, in "A War Despatch at the Hôtel de Ville" (444), the purport of the despatch being shouted through the window to the crowd by a gentleman who stands on a chair, and is bawling at the full pitch of his voice, steadying himself against the window-sash; the contrast between his obviously rather theatrical energy and the easy half-critical manner of the group within the room is very well given.

Mr. Poole generally contributes something powerful,—something that compels us to pause in going even hastily round the room; but he is hardly at his best this year. We cannot care for his "Smithfield" (487), where some women are looking for relics in the early morning after one of those horrible "executions" which made the name of the locality infamous. The scene is lighted half by the early dawn light, half by the lanterns of the seekers; the effect of light having apparently been the main object, and appearing too decidedly to be so: and the long quotation in the catalogue has no point as regards the picture, since it refers to the scene of Anne Askew's trial, not to her execution,—still less to the morning after. Mr. Poole's best work, though a much quieter one, is "Harvest Time," in Gallery III.; but altogether this fine and usually imaginative painter is hardly *en première force* this year. The central place in Gallery VI. is occupied by Mr. P. R. Morris, who has attempted a difficult task in making a picture of figures nearly all clad in white,—a number of young girls going in procession to "Première Communion" (506) at Dieppe. Candidates for confirmation, like nuns, are always pretty in pictures, but these countenances do not affect us otherwise than as pretty; they could not, indeed, have much expression, for they are all singing as they walk; and on the whole one feels there is a good deal of canvas expended on mere white dresses and veils, without enough to show for it. The most interesting group is that of the old peasant people on the right. It is curious to recollect that the last prominent picture of women singing in procession at the Academy was Mr. Leighton's "Daphnephoria"; but what a gulf separates the two subjects!

Mr. Rivière has made another hit in "Sympathy" (496), which perhaps after all is his best work this year, and it may be said that he has never shown such a variety of power in one exhibition before. The picture represents a somewhat sulky little child who has sat down on the stairs to indulge his feelings, while his favourite dog comes and puts his head against the child's cheek: a certain similarity of expression between child and animal is realised in a half-ludicrous manner, but without in the least imparting a human expression to the latter, which is the mistake sometimes made by animal painters in subjects of this kind. Sir John Gilbert's "May-dew" (550) is an effort in a new line again for him, but not by any means so successful as his Venetian Council Scene last year; it illustrates some verses of Mackay's, or is illustrated by them, one cannot say which; a party of ladies have gone out, in very high spirits, obviously, to revel in the morning dew; but they are to us impossible or undefinable figures, not like real life, and belonging to one knows not what period or state of society. Mr. Erskine Nicol, generally humorous, is here tragic, in his picture called "The Missing Boat" (534), showing a party of rough hard Scotch fisher-folk, men, women, and boys, looking anxiously out from over a wet pier-wall, with a strong gale blowing in their faces; there is a great deal of powerful expression in this work. Mr. Eyre Crowe sends a large painting of a subject much better suited to his powers than the serious or quasi-classical ones which he tried last year; it is a "School Treat" (567), the children in several wagons, just preparing to start; it is a large canvas full of small figures to which a great amount of study has been given; the various characters of the children, the mistresses or young lady teachers, and the drivers, are admirably discriminated; the horses are each a study, not less so the dog panting in the heat in the middle of the picture, impatient to be off. This is an exceedingly able work, and one to which no little study must have been given. Mr. Sant's portrait group of three young ladies (513) is a very graceful and successful work; in regard to colour, the portraits of this artist seem somewhat deficient in flesh tints as compared with some more recent schools of portrait-painting, but the grace and refinement of design have alway the same charm.

No one at first sight would guess that "The Tomb" (590), was by the same hand as the "Première Communion." Mr. Morris, who is an obviously rising painter, will not at any rate fail from lack of enterprise and ambition. "The Tomb" is a ruined monument on the site of an old abbey, but the picture is really a large animal painting, deer and a peacock: it is very carefully studied and very able in every way, and grouped so as to produce a fine pyramidal effect, the peacock perched on the tomb forming the climax. The picture occu-

pies the post of honour in Gallery VII. This room presents us with two battle pictures, both of which, strictly speaking, are retreats; the "Halt of Charles Edward on the Nairne, after Culloden" (584), by Mr. Beavis; and the "Retreat of Wellington from Quatre Bras to Waterloo," by Mr. Crofts (609). The first is chiefly noticeable for the manner in which the painter has felt the reality of the incidents after a battle, in the pathetic appearance of the wounded lads (mere lads) who are painfully carried over the stream by their comrades. Mr. Croft's picture marks the continued success of a painter who has only been heard of for about three years past, who has chosen his task and worked at it systematically with constantly-increasing power. In this work "The Duke" rides up the centre of the picture at the head of the column, which winds away into the distance behind him, and the leading members of which present a curiously contrasted group of sound and wounded men and prisoners; the soldier in Highland dress, who marches by the side of the chief, and probably is one of his personal attendants, is a complete summing up of the soldier character in one figure. On the left a squadron of the Greys lower their swords and shout as the duke passes; in the distance we see the guns in the open, galloping back in the contrary direction of the column, to give another check to the enemy. The whole thing, as far as an unmilitary spectator can judge, is remarkably real, and full of brilliant talent. Mr. H. Moore has "A Moonlight Sea" (638) with all his usual fine qualities of feeling and execution in such subjects; indeed, we should call the work, though not large, an exceptionally fine specimen of his genius. One of the most beautiful pictures in the Exhibition is cornered in this room,—Mr. Arthur Hughes's "Uncertainty" (602): a figure of a beautiful and refined-looking girl, who, standing in the embrasure of a window, awaits apparently the result of a conference between her father and her lover, who is seen in the background just entering the father's room. The story is made more complete by the manner in which the greyhound, evidently the canine friend of the lover, looks up at the girl, regarding her as a familiar acquaintance. The fine painting of every part of the picture, the warm rich glow of light over the whole, and the beautiful feeling conveyed in the principal figure, combine to produce a work of very touching interest, and in sentiment and association quite above the average of exhibition pictures.

The Lecture-room contains some noteworthy works; in especial that of Mr. Herkomer,—"Eventide: a Scene in the Westminster Union" (1,002), a study of old women, marked by much truth and pathos, not without its admixture, also, of the humorous element. One or two of the other names that have in recent years attracted us, as full of promise, are represented in this room: Mr. Seymour Lucas, by his clever pictures, "A Doubtful Date" (957) and "An Ambuscade, Edge Hill" (931); the latter a most real and spirited work, in which a party of Puritan troopers, marching along a lane, have suddenly come into the range of certain cavalier marksmen *perdus* in a cornfield; the leader, a very characteristic figure, pauses cautiously, a man behind him falls. Mr. Waller, who will be remembered by his "Home?" last year, has another picture combining a study of deer with a human interest, in "The King's Banner" (927), the unfortunate bearer of which is left dead with his horse in the avenue of some old estate, and is the centre of curiosity to the deer: the picture is a singular one, very suggestive, however, and very clever. Mr. Armitage has made a curious and interesting experiment in a very elaborate painting of "Pygmalion's Statue coming to Life" (the second treatment of the subject which we have noticed this year): a faint flush of life has come over the upper portion of the figure, but not reached the feet, which are still cold white marble: the marble drapery which falls behind the figure serves to throw out the very delicate flesh-tint of the upper portion: the sculptor has fallen with face buried in his hands on the pedestal, but whether with alarm at the prodigy, or in prayer for its accomplishment, is not obvious. The picture is exceedingly clever, but there is the same complaint against it as against Mr. Tadema's painting, the figure is not beautiful *per se*.

We have other notes to make on some of the less prominent, but not always less meritorious works.

THE SCREWING UP AT ST. ALBAN'S ABBEY.

THE work of pushing the nave wall into perpendicular was completed on the 2nd instant, the day on which it was commenced, so far, at least, as the operation of the presses and screw-ties was concerned. It would, perhaps, have been better, however, if the upper portion of the work had been more deliberately proceeded with, and its immediate completion not been made a point of, as it seemed to have been, for though the operation on the lower part had been very successful, the wall has got rather rough handling in the upper portion. The splits which we mentioned in the piers, in our last article, were very thin, scarcely involving any movement of the stone; or any material injury to the cohesion and stability of the piers, so far as appears at present; or anything which cannot be easily made good in regard to appearance. But the upper portion of the wall has much less bond; it is, in fact, a sort of pudding of masonry rather than a wall, and advantage seems to have been taken of its consequent flexibility to push one portion after another, applying the force at certain points successively, not simultaneously. It is obvious, as we mentioned last week, that it was easier to keep the presses under control when working them separately, and that to have done the whole length simultaneously, would have required much more consideration and more elaborate arrangement of the presses so as to regulate the pressure to the right proportion at each point; and the preparations necessary for doing this would very likely have occupied too much time to allow of the completion of the work the same day, and would have necessitated a slower movement than seems to have been used. But it is probable that an exceedingly slow movement, carried on simultaneously along the whole length of the wall, might have got it into position with less evidence of hard usage than it now shows internally. As it is, the result has been that too much has been done at one point, too little at another; in some places the wall has been forced over beyond the perpendicular to the extent of a couple of inches; in other places it still wants to come more over; and the internal line of the wall under the feet of the principals, when the eye is run along it, is still very meandering. Part of the difficulty may have arisen from the want of correspondence betweeen the inner and outer surfaces of the wall itself; for, during the earlier part of the work, word was passed that at one point the wall was plumb inside, while it was still hanging over externally. The necessary conclusion is either that the wall is thicker at the top than at the bottom, or that it has split down the centre. There is no doubt that the nature of the wall at this point rendered the treatment of it very difficult; how very little longitudinal cohesion there was in it became evident in walking along the internal scaffold on the clearstory level; for at the points against which the heaviest action of the presses had been used, the wall was bulged as if the timber struts intended to come through; in fact, the wall sagged horizontally between the struts, just as a weak roof sags vertically between the principals. In two instances the two jambs and arches of the windows had felt the pressure so unequally that at the vertical joint at the apex of the arch the outer edge of the hood-mould on one side of the joint nearly coincided with the wall plane on the other side: the appearance may be imagined. No mischief has been done that is irreparable, but the taking down and resetting of some portions of the inner face of masonry in the clearstory will probably be necessary to bring things to their proper condition.

The horizontal pushing-in of the wall at certain points, however, was not the only mark left upon it; and the other incident we note is rather important, as it suggests a possible source of difficulty which has perhaps not been taken into account. This is, that in several places the piers, both in the triforium and clearstory, have parted vertically on the joints in the inner face, the course over a joint having lifted, apparently, so as to leave the joint gaping to the extent of a quarter of an inch or more. Now, it seems impossible that a mere pushing action on the external face of the wall, tending to force it over towards the interior, could have the effect of opening the joints in the interior face. The explanation we suggest is, that the raking shores have exercised a lifting as well as a pushing force, the effect of which has been overlooked. The shores acted upon crossheads placed against the wall, which again were confined from upward movement by baulks placed in the walls at right angles to the surface; otherwise at the angle at which the shores operated, they would merely have pushed the crossheads and templates up the surface of the wall. But, the end of the shore being thus confined, and its angle with the wall not very great (a good deal less than 45°, we should say from recollection), it appears to us that it would exercise a considerable *upward* thrust upon the wall, and that the effect of this would be all the more apparent in the upper part of the wall where the proportion of the vertical pressure to the angle of thrust of the shore was less than in the lower portion; and this explains why the joints should have opened above, on the inside, though they did not do so below. The opening of the joints is a patent fact requiring explanation, at all events; and if this is, as we suspect, the explanation, and part of the wall has in reality been vertically lifted as well as pushed over, it is a point to be considered in regard to the effect upon the whole when the hydraulic presses are relaxed and the shores struck. We strongly suspect that unless this is very carefully and cautiously done, some difficulties will occur with the wall before it gets fully settled to its bearing in every part.

The thrusting back of the wall has effected one thing,—it has brought the wall back to a point at which the yet solid portion of the tie-beams can find a bearing on it. The present roof timbers were cut to fit the space in the bulged state of the wall; the bearing portions are, as we mentioned last week, entirely rotted away, and the real bearing of most of them was on flitches of iron screwed to each side of the beams. The ends of these flitches served to mark very prominently during the operations the extent to which the wall had been sent back; the irons which were within the face of the wall in the morning being seen long before noon jutting out in a row, like so many spout-heads. As to the restoration of the roof, it seems from what we hear that there are divided counsels, most of the committee being in favour of making the present one "do," while one very energetic member, who alone of the committee is equal to going up ladders and seeing for himself (and whose name some of our readers will readily guess), is strongly in favour of having it down, and is right in his opinion; it would be absurd to tinker up such rotten stuff, so badly put together at the best.

DUTCH DRAWINGS AT THE BURLINGTON FINE ARTS CLUB.

THIS collection of sketches and studies by Dutch masters at present to be seen, by the courtesy of members, at the Gallery of the Burlington Club, is of great interest as showing some of the earliest efforts in water-colour art, and also as exhibiting to us the work of some of the earlier and now not much remembered artists who were the precursors of some greater or more successful men. Thus, the work of Zeeman, whose Indian-ink sketches of calm seas and lazy shipping are beautiful in themselves, has an additional interest, as being obviously the forerunner of Vandevelde. Even if the latter were not directly indebted to Zeeman for his style and choice of subjects, Zeeman's drawings go to show that there was a previous bias towards this class of scene and treatment in Dutch painting, of which Vandevelde was the culmination. We find also, in looking through the collection, that the love of brick buildings, and the power of representing with faithful minuteness and truth, are not so peculiarly an attainment of Van der Heyde as the study of the Peel collection in the National Gallery might lead us to think; there are drawings here bearing names much less familiar, which rival Van der Heyde in his peculiar qualities and taste. Among the water-colours, those by Ostade, and the flower and fruit studies of Van Huysum and Van Os, are the most remarkable, and are alone well worth a visit to the club, though not numerous. The Ostade water-colours are mostly highly finished, and include some of the finest designs he ever made; one numbered 29 in the catalogue is a remarkable and celebrated drawing, an exterior of a cottage with figures, in which what strikes one especially is the variety and close approach to truth of the local colour, in spite of the obviously limited scale of pigments at the artist's disposal. A small interior, No. 32, is one of the most perfect in composition we have ever seen.

by Ostade, who was such a master in this way; *ars est celare artem* could hardly be better illustrated, for every object in the scene is disposed with regard to a harmonious combination of lines, as is evident if we come to think of and study it, though nothing could appear more natural and unstudied when looked at as a result. It is worth while to compare with these Dusart's interior (115), in a somewhat Ostade style, and painted with much the same resources in pigments, to realise how much delicacy of gradation Ostade obtained with his water-colours. Dusart's drawing is more highly finished in some ways, but comparatively raw and crude in colour. Two very interesting little landscape sketches by De Koningh (47, 48) show the way in which this fine landscape-painter put his first ideas for his pictures into shape.

There are some capital separate figure-studies: a remarkable one by Van Mieris, executed on vellum with black chalk, with great delicacy of finish, the effect of which is heightened by the peculiarity of the material on which it is drawn. A "Pastorale" (113), by the same artist,—a small work with two figures,—is very noble and dignified in style. A crayon study of a peasant playing the violin, by Zorg (59), and a study of the same kind by Jan Steen (73), are both remarkable for their intensity of expression and individuality of manner. In the Jan Steen drawing a man examines a bottle of some liquid, holding it against the light, with open mouth and screwed-up eyes. There are some fine drawings by Paul Potter, and there is a rival of Paul Potter in Balthasar Paul Ommeganck, whose drawing of a bull tied to a tree (133) is splendidly forcible and true in action. As to the before-named fruit and flower pieces, they are absolutely marvellous: one by Van Os (132), perhaps, surpasses all; the hues and reflected tints of the leaves and flowers are given with a subtlety and delicacy which rival Nature herself.

At one end of the room there are a number of small sketches by Rembrandt, mostly rather rough pen outlines, but many of them of great force and interest. To describe the sketch No. 22, however, as "highly-finished drawing in sepia" is certainly a stretch of enthusiasm on the part of the compilers of the catalogue. But the whole collection is a very remarkable and interesting one.

ART AND MIND.

LIVERPOOL ARCHITECTURAL SOCIETY.

THE retiring president, Mr. J. M. Hay, delivered an address at the last meeting of this society. He said,—Let me speak for a moment of our national style which I endeavoured in my opening address to defend from some prejudices and misrepresentations. Let me (addressing myself more especially, but not exclusively, to the student members), insist upon the exercise of free thought, and what inventive power we possess upon this style, which I take to be not our style only, but, with local modifications, the style of Western Europe. To free thought all styles and all arts owe their origin, and the truly national style is what sincere thought and invention are to evolve from the ancient architecture of the Greeks and Romans, laying the Italian, the Gothic, and all other styles under contribution in the process. Therefore, developing it and applying it to new purposes, by the continued exercise of the same faculties that originally produced it, is the best way to follow the Greeks, and make the style what they themselves would have made it under the same circumstances. The loftiest and most refined elements of the style are to experience the transforming power of the imagination, and to be re-cast in the mould of local and modern surroundings.

Let me press on the student the truth that a true work of art cannot be made from the grandest of styles without the pervading element of mind—without receiving its finer influences from the life within,—and that with this fusing power he can do anything. No matter how broad his eclecticism—no matter where or at what time his materials originated,—the result of their re-combination will be satisfactory.

It is with the architect as with the painter: it is immaterial where the latter collects the materials he introduces into his picture if he combine them so as to produce breadth of light and shade, and brilliancy and harmony of colour, and give life and beauty to the whole.

There are modern buildings that prove this; the better works of the Italian of the Cinque Cento were cast in a correct modification of the Greek mould. The Venetian architects, Palladio, Sansovino, and others, made new application of the style, and advanced, I think, in some respects on their predecessors and contemporaries of Rome and Florence. True examples of this style may be found in our own country, in St. Paul's Cathedral, and in other churches of Wren, and in those of Gibbs and Chambers, as well as in the works of the German and French architects—the latter, especially in Paris, are showing admirably the ductility and elasticity of the style.

There is no need of employing the chief characteristic features of the style, columns, and pilasters, merely as decoration. So much of columnar grandeur can be given to essential features,—doors and windows,—that the lack of columns and pilasters elsewhere would not be felt, and the restriction of these elements to the useful features, so far from crippling the style, would only lead to fresh fields and pastures new.

The next important thing, perhaps, in reference to future architecture, is to let scientific and constructive skill proceed in their onward course untrammelled by considerations of decorative style or artistic beauty. Beauty is utility in blossom,—for the union of science and art is indissoluble. The architect must throw the reins on the neck of circumstances, architecture being, like ourselves, very much the creature of circumstances. He who has learned to do so will not consider any necessary utilitarian feature an obstacle to beauty; but, on the contrary, an opportunity for some new phase of beauty and the display of greater originality and truth. Then beauty of the right and expressive kind will grow up. Art dwells not in any particular class of buildings, or in any particular style; but in the soul of the true artist; and its office is neither to exhibit an old style nor invent a new one, but to imbue the necessary construction of the day with life and sentiment. No age has been richer than our own in means and appliances, or presented scope for greater originality, and everything points to progress in our architecture,—progress in many respects beyond anything that has gone before. We cannot again build Egyptian pyramids, Roman amphitheatres, or Greek temples; and we need not grieve for this, for, connecting architecture with a higher condition of humanity,—bringing it into loftier associations,—we may build works of which the Roman masters of the world would have been proud.

But we must be careful not to narrow our sympathies. Adoption of any particular phase or historic period of the style,—as the manner of Queen Anne's reign,—shows a narrowness of mind and misconception of the true nature of fine art. We want a style broader than anything that the architecture of Queen Anne's reign suggests, and such is the one in question, which may reflect all styles and all periods of art, and be not a little influenced by the ecclesiastical style of the Gothic, which we prize so much; which will, I think, have the effect of lessening the distance between, and bringing their respective works into greater harmony with each other than they have yet shown. Styles have always been influenced by others in their neighbourhood, and many styles have arisen by the amalgamation of the elements of two styles. Besides, we should be in a condition to look down on the architecture of Queen Anne's reign; we have greatly advanced in others of the fine arts, poetry and painting, as well as in the science of Government, since the days of Pope and Bolingbroke.

The question of water-supply is one destined to occupy public attention to a greater extent than it has hitherto done. We in Liverpool have not as yet decided upon anything. In the neighbouring city of Manchester the corporation have a Bill before Parliament for obtaining their water from Thirlmere Lake, in Cumberland. This scheme has encountered considerable opposition from artists, persons of taste, and lovers of natural scenery, who maintain that by erecting an embankment at the lower end of this shallow lake, in order to raise the level of the water some 50 ft., the beautiful contour of its margin will be destroyed, and the natural beauty of one of the loveliest spots in Great Britain seriously impaired; that the people of this country have a vested interest in the preservation of such places, and that it is not in the right of any lord of the soil, who may for the time being be in actual possession, to allow them to be disfigured, whether from motives of avarice or sheer indifference.

The House of Commons is not a place where sentiment of this kind is much regarded. Above all things the Commons pique themselves on being an assembly of practical men. They will, I fear, give little heed to æsthetic considerations, and will no doubt say if Manchester wants the water and there is no other place to get it, let them get it from Thirlmere, even though it should utterly and for ever destroy its unique charm and loveliness.

But supposing the Bill passed, and the scheme carried out in its entirety, does it follow that this shallow lake transformed into a large sheet of water, and called the "Thirlmere Reservoir," must of necessity be ugly? or that the aqueduct conveying the water should disfigure the landscape?

Let the artist and architect be co-partners of the engineer entrusted with the execution of the work, and the graces of art may be made to compensate in some measure for any necessary interference with natural beauty. A railway or aqueduct carried on numerous arches across a valley, whether in a straight or curvilinear direction, contains so many elements of beauty in itself that it would not be a formidable object to deal with, and even the pumping station and high chimney might be so placed with respect to selection of site and architectural treatment as to enhance the beauty of the landscape.

I never could heartily sympathise with the great poet Wordsworth in his terror at the very idea of the locomotive invading the peaceful serenity of his mountain home—which, probably, was considerably allayed before he left the scene which his genius has hallowed. The rush and hush of life cannot be realised or better represented anywhere than by the sudden appearance and withdrawal in high land districts of a railway-train, puffing, hissing, rattling along, and then nothing left but the wreath of white vapour gently dissolving into nought. The Swiss châlet on the mountain side, the mere morsel of a human habitation, does not, nor does a number of them, detract from, but rather aids and intensifies, that sublime solitude which is the grand characteristic of mountain scenery.

The great subject of water supply, however, is not one limited as in this particular instance to a question of preservation or destruction of the natural scenery of any particular spot, but as to how the wants of the nation at large are to be met in the face of an increasing population and the various eligible sources of supply becoming appropriated.

It is evidently in view of such an exigency that the Prince of Wales, in an excellent letter addressed to the Society of Arts, has directed the attention of the Council to this very question, and to the propriety of offering prizes for the best scheme of water supply, which should be national in character, collecting water from all available points of supply, and making provision for the wants not only of large towns, but every village and hamlet in the kingdom.

This is a grand and comprehensive idea, and opens up a new field for the display of engineering enterprise and skill. May those who engage in it be impressed with the obligation under which they lie to deal gently with the fair bosom of nature, and ever to remember that true glory consists in creating, not in destroying.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE following is a list of the Council and officers, and also of the Board of Examiners under the Metropolitan Building Act, elected for the ensuing twelve months at the annual meeting, held on Monday last:—

President.—Charles Barry, F.S.A.

Vice-Presidents.—John Whichcord, F.S.A.; G. E. Street, R.A.; Professor Lewis, F.S.A.

Ordinary Members of Council.—Henry Currey, John Gibson, Alfred Waterhouse, A.R.A.; E. I'Anson, F.G.S.; E. M. Barry, R.A.; E. Christian, Horace Jones, G. Vulliamy, T. Worthington (Manchester), J. L. Pearson, A.R.A.; A. W. Blomfield, M.A.; D. Brandon, F.S.A.; J. Clarke, F.S.A.; O. Hansard, J. Honeyman (Glasgow).

Honorary Secretary.—Fred. P. Cockerell.

Secretary.—William H. White.

The above form the Council.

Auditors.—W. A. Boulnois, Francis T. Dollman.

Board of Examiners, Metropolitan Building Act.—W. A. Boulnois, H. Dawson, C. Fowler, C. F. Hayward, F.S.A.; E. I'Anson, F.G.S.; J. Jennings, Professor Kerr, J. T. Knowles, Professor T. H. Lewis, Edwin Nash, Rowland Plumbe, John Whichcord, F.S.A.; Sancton Wood.

NEW YORK HOUSEHOLD TASTE.

NOTWITHSTANDING the gloriously independent right we all have in America to our own opinion, and the proverbial but still questionable dictum that tastes differ, the tolerably thoughtful mind is strongly disposed to admit that taste may be something more than a capricious instinct leading many uncultured people to have a leaning towards pernicious things; but most of these people admit that taste, after all, has been well understood for ages to mean something that the peculiarly gifted are alone initiated in.

There can be no question that the same standards of taste regulate the households of New York, and, indeed, the whole of the United States of America, as those of many English people. For centuries there have existed in the country many families surrounded with household gods of precisely the same character, neither better nor worse, than are to be met with in thousands of middle-class houses at home.

In America, of course, one meets with a diversity, arising from the number of nationalities that are here represented, but England and English ways, like its distorted tongue, prevail and appear most to be esteemed. Some fine old specimens of the true Anglo-American lady still advocate dressing like English gentlewomen in preference to the more successful adaptation of the Parisian; the large German population invariably giving up their own ideas as regards the adornment of their fair persons, and copying, as far as their prudent ways allow them, the *modes* of the Rue de la Paix and the Faubourg St. Honoré.

The great change that has taken place in what may be strictly considered household taste in America since Mr. Charles Eastlake's book has been so widely spread in this country, has led to the multiplication and the rapid manufacture of means for making the houses here beautiful, the beauty being of a kind that would cause the author of that book to regret that he had been the innocent means of encouraging so thorough a misunderstanding of correct principles.

The American art-lover — and he abounds here—is a much more severe critic of the surrounding errors of taste than his English cousins, who, in many high quarters, are utterly indifferent, at least, to any new ideas on the subject; and those gentlemen who in this country give expression to their opinions, show a contempt for their brethren which must be perfectly refreshing to the true and good hater of America and its institutions.

We do not think that any really well-instructed American has any desire to claim more than an equality of taste with the rest of the world in household matters, or on any other subjects relating to our intellectual progress; and we should think that a very little reflection must assuredly lead the thinker to the conclusion that it can be but in very rare instances that American artists arrive at their positions of honour through other than the long-recognised channels.

The professional household decorator here and the mercantile speculators in this line are sufficiently ready to avail themselves of foreign aid, and the mere purveyor of household beauty manifests a faith in the merits of Viennese and Parisian art,—and in fact in all objects that he has to dispose of,—that is worthy a higher cause. Like his brethren in other profitable markets, he regards the object he has to furnish as merely an ephemeral thing to be put aside next season for another style. The Gothic, one day being the rage, the Queen Anne style another day, to be put aside for the Washington or the Victoria; the former, by the bye, a suggestion that we here give the trade the gratuitous advantage of, the latter positively admitting of a range so wide that the man who condemns all will condemn much that is not likely to be excelled; for in no period of future civilisation can we expect to have within our reach, on terms so easy, so large an amount of beautiful household surroundings; all that appears to be wanted is a wholesome condemnation of the bad and basely-constructed, so as to allow the good and simple a little more room to be seen.

For many ages past each century has had a special taste to consider, and the distinction which all of us can so easily detect between tenth and seventeenth century household matters is scarcely less marked between this century and the last, or between this moment and fifty years ago; although few living authorities on such subjects are sufficiently broad-minded to acknowledge much merit to our immediate fathers as household comforters; and the few who remember sixty years back are just as unwilling to admit the ability of the present generation to teach the world how to surround themselves, or how to add to charms of an old-fashioned fireside, or where to place an additional cushion in a substantial deep, square-shaped bedroom easy-chair.

It is, after all, a melancholy reflection that in spite of the lecturing and preaching on the subject, there is no more household taste in America, or little more in England, than in the years past that so many are in the habit of alternately extolling or reviling; the new needs of the present generation have compelled the producers of pretty things to change their methods in order to accommodate a new demand, and in a few, very few, noticeable instances the artists have kept always before them the necessity of aiming to promote a love of what has long been acknowledged to be right.

In America the expression "awful" may be fairly made use of in connexion with household taste; but not even the most reckless *debauché* in modern slang could say of the household taste of New York, that it is, under any circumstances, "awfully jolly."

How long have you been gay? may be asked of the New Yorker at home, precisely in the same spirit, and with equal significance, as applied by the interlocutor in Mr. Leech's inimitable picture; and how long it will be before they will return to the comfortable household surroundings of their ancestors is an equally difficult question to answer.

How is it that the New Yorkers, so many of whom pride themselves on their Dutch origin, have not contrived to build and keep up houses after the fashion of the famous old towns of the days of the Dutch Republic? In England our great Dutch millionaire built his modern house in London in exact imitation of his Amsterdam palace; and why so many others here, who are not ashamed of their English descent, do not adopt instead of the Queen Anne style, or the Gothic, or what not, a good Washingtonian manner of conducting their homes and their morals, is a mystery to us.

It may, without injustice, be said of the New Yorkers that there are at least here a smaller proportion of home-loving inhabitants than in any other city of the world; and whenever the household taste appears of a tolerable standard, it is not owing to any respect to the surroundings, beyond the advantage such surroundings give fine people to appear well up in such matters; the reward looked for is an ignoble one, and with the discord of vice that reigns here, it is not strange that there should appear a want of harmony between down-town speculation and up-town social emulation.

The rules of life in New York are simple enough, but in any question of doubt New Yorkers are not easily instructed by reference to any of those canons of taste or morality that nations longer cultured have consulted.

There are here a proportion of the population, not a very large section, who, after a fashion, devote some study to household taste, and with this view read assiduously a great deal that is now written for our edification. On the whole, we have not found the household taste of people in America quite so bigoted to any particular style as the faddish people in England have long been, who talk and decorate up to a period.

The popular European decorator, whether he resides in Paris, London, or Vienna, is good enough for a thorough New Yorker; and here there are very few small people who have sufficient leisure to carry out decoration on a limited scale: every one in New York who has any pretensions,—and here we are literally all pretenders,—is willing to wait, if not patiently, still willing to "hold on" until the arrival of that happy time when their ships come in again, and they have at their command the best of everything.

In an age when manufacturers believe they have touched the utmost limits of improvement, and still more, at a time when capitalists think that nothing is denied to well-directed combination, it is difficult to induce a young people to wait for the results of patient ill-rewarded labour; for the disposition of the period is to scoff, we hear, at the hope of rewards that pass all understanding, and the possibility of enjoyment in this world at a cheap rate is associated with the idea of something nasty; the notion of simplicity and inexpensiveness possesses no charm whatever to the modern everyday mind; small things seem to have gone out with small beer and all other domestic economies. As for a small and well-conducted household in New York, such an establishment is altogether comparative, and probably the idea of a house like that the late Comte d'Orsay was unable to keep up in Curzon-street, Mayfair, or of a house like old Samuel Rogers's in St. James's-place, has not entered the mind of that extraordinary personage, a thorough New Yorker.

A newly-arrived Britisher, taking his first walk down Fifth Avenue, or paying his first visit at a great house, would be apt to form hastily the opinion that there exists here a rather higher standard of household taste than is ordinarily to be found at home; so many of our friends at a distance are still happily surrounded with the belongings of their grandfathers, that in nine cases out of ten the houses of our friends in England have what is irreverently called an "old fogey" appearance; and it must be owned that a general dinginess pervades a middle-class London house that gives the stranger,—he, at least, who thinks much of such things,—the impression that the furniture, picture-frames, carpets, and especially the curtains, want renewing.

We, when in London, do not all of us live in Belgrave-square or Park-lane, and even when we visit in those favoured quarters, we who are devotees of the present style of furniture, find many objects to quarrel with, although for ourselves we have long learnt to be content to live in the discomfort that surrounds the inhabitants of Mayfair and Belgravia; nor have we found in the houses decorated and made beautiful by the modern artists, more luxurious seats on which to rest our wearied limbs, or on which our fatigued mind can repose with confidence that the chair is perfectly comfortable.

Here in New York the dingy is to be met with alone in houses such as presentable strangers rarely visit, although in these "hard times,"—times that are beginning rapidly to petrify,—some very nice American people live in anything but nice apartments, and the household taste that surrounds the vast majority of dwellers in this city is in reality of a kind calculated to make the methodical domestic grumble fearfully.

But here in New York beware of examination, that is, if you happen to know anything about household matters; be content with the impression that you have probably received that you are surrounded with evidences of wealth and a certain show of stability; you are assuredly witnessing the result of an expenditure during an earlier good time, and never mind about taste, it is a sickening subject to many of us. It is not many people who know what is meant by style or in what it consists, so take your friends here for what they appear to be worth, and for whatever they please to call themselves, and admire them, not for their big houses and costly furniture, but for that superiority in all things which you will soon learn from them they possess in a high degree.

No doubt there are houses in New York in which we may find,—discover is exactly the right word, — remote evidences of sound taste, but these will be found to lean in a material direction, carrying one back to those pleasant old homely days when certain families were proud of their domestic achievements, when corn-cakes and "chicken-fixings" were household triumphs; and in such houses evidences of taste of a consistent nature will be found in the well-kept surroundings of an earlier period, the portrait of grandpapa, by Gilbert Stuart; a lovely miniature of grandmamma, by Malbone; a view of the Colosseum by moonlight; an early drawing by Glenny, before Macpherson and Anderson's photographic days; a cameo-portrait by Solini; and in one instance that we can recall of good taste, we were shown the portrait of our host's first wife, painted by Angelica Kauffmann, in Rome, in 1792.

Here and there in New York may be found traces of household taste, such as the visit to Rome fifty years ago encouraged in some minds; but where this order of taste still lingers it is invariably in America muddled up with horsehair and Utrecht velvet seats, and highly-coloured Berlin wool-work of thirty or forty years ago,—in those good times when the Mesdames Inglis and MacLeods, in their pleasant Staten Island quarters, taught the fair New Yorkers how to become fine ladies.

What taste one meets with here now is imitative stuff, acquired from sources in themselves very questionable, and little remains to attest

the fact that we are living in a progressive country. America must be yet more flooded with "shoddy" of every kind, poor copies of all good things, a perfect deluge must overwhelm the city homes of this people, before a love can be created for simple household surroundings.

They make much, not too much, of their few distinguished writers, but we suspect that Irving and Prescott, Ticknor and Bancroft, owe quite as much to their affluent connexions as to their literary ability; and, as for the scientists and artists, the former are well able to take care of themselves, but the painters and sculptors must look for their laurels, as they are now doing, to Europe.

Whenever the American commercial and legislative troubles return to ordinary ways and means of success, we English may find ourselves defeated in many large branches on which we have for too long a period confidently relied; then will be the time for America to think seriously of studying out and defeating us in the matter of household taste, when they have secured what they appear desirous of becoming, in the first place, the directors and owners of the world's great shop for all useful, but for no portion of the beautiful, objects that we all seem to require. In the meantime they will become enriched by our needs and their own industry. France will always supply them with their taste for finery; the English will be able to furnish them with any quantity of the bad that they are still unrivalled in their ability to produce,—objects, as bad almost as Germany or any other country can turn out, if not at quite so low a price.

Let years and years of a wretched government such as now exists in America work its worst throughout the terrible experience and fearful lessons that have yet to be learnt here, and then let a few brilliant years of well-won commercial success overtake America, and New York household taste with other blessings may reach a perfection that older countries may sigh in vain to emulate, unless,—but, perhaps, by that time the very climate may have changed, when Eastern magnificence and Western ingenuity may be successfully combined in New York and its surrounding country.

New York.

HOW THE PUBLIC MONEY GOES.

THERE has recently been issued by the Queen's printers a report which is not unworthy of some notice. It is the first report from the Committee of Public Accounts, together with the minutes of evidence taken during the present year. The actual subjects hitherto investigated by this Parliamentary Committee have been the appropriation accounts of the sums granted by Parliament for Civil Services, Class I. to VII., for the year ending March 13th, 1877. Much that is contained in this volume does not come within our province to notice; such, for example, as convict establishments in England and the Colonies. But, on the other hand, there are some parts of it which are well worth notice, and which show the remarkable way in which too frequently the public funds are spent. These portions should not be allowed to lie in serene peacefulness in the pages of a Blue Book; it is highly desirable that they should afford a few minutes' thought for the public, who are the persons chiefly interested in knowing how the public money goes.

We turn, then, to Class IV., vote 2, Science and Art Department. It will be remembered that in the course of last year there was a loan exhibition of "science apparatus" at South Kensington,—a thing commendable in its way, but of no great public utility, interesting but to a very few persons, and, we will venture to add, of small advantage to the cause of true science. What would any one suppose was the amount which this little bill actually attained in times when the public have need for every penny of their money? This is how it is described by the committee:—"In addition to the sum of 13,677*l.* 10s. 7d. shown (in the accounts), it is stated that there was a previous payment of about 500*l.* in 1875-76, on account of the exhibition, and that there are still outstanding claims which will amount to about 1,000*l.* The total cost of the exhibition will thus probably exceed 15,000*l.*, an expenditure which was incurred *without the knowledge of Parliament or Treasury sanction.* Explanations were made to your committee, showing the gradual manner in which the proportions, and consequently the expenses, of this exhibition had grown; but they trust that the minutes issued by the Committee of Council on Education, dated December 18th, 1876, will prevent the recurrence of these grave irregularities." "Grave irregularities," albeit it is a term of strong Parliamentary censure, is none too strong for the waste of money which took place in regard to the recent exhibition at South Kensington.

In the first place, the estimates were in no way equal to the amount which was spent; in the second, even these estimates were far too high; and in the third the actual expenditure was absolutely wasteful. Thus, for the preparation of catalogues the estimate was 1,700*l.* odd, whereas the actual amount paid amounted to 3,600*l.* It is true that included catalogues for other things connected with the South Kensington Museum; but just let these questions and answers be considered for a moment, and we venture to think that any ordinary man of business will consider the way in which the finances of South Kensington are managed as being seriously bad. Q. 277. "How much did you under-estimate your own expense in the matter of catalogues?"—"We under-estimated it by the difference between 1,700*l.* plus 841*l.* 15s. and 3,666*l.* 5s. 3d." Q. 277. "Then you under-estimated it by about 1,100*l.*?"—"Yes." Imagine the amount of forethought and care expended upon the finances of an establishment when the cost of catalogues alone is under-estimated by 1,100*l.* But attend to what follows. Q. 281. "Can you give any explanation of the reason why your estimate was 1,100*l.* wrong for the ordinary catalogues?"—"No." Absolutely no reason given; no unexpected event occurred; simply the officials were incapable of being in their calculations within 1,000*l.* of the amount required or spent.

Then, to take another example furnished by the questions of Mr. Goldney, one of the committee. The bare question and answer are significant of the want of management and forethought which this Blue Book has exposed. Q. 302. "I will take another item. You added 1,000*l.* to D. 4, 'furniture, fittings, and materials'?"—"We did." Q. 303. "But instead of spending 6,800*l.* you spent 9,600*l.*: you must have made some calculation about that, I should think?"—"As I said before, this special exhibition grew in size." We might, from this examination of Mr. Norman MacLeod, take any number of similar instances of want of forethought and of squandering of the public money. It is enough, however, to show by the above examples how the public money goes,—at the South Kensington Museum at least. In the first place, it must be considered an extraordinary act to contemplate spending many thousands of public money without consulting Parliament beforehand on the matter. We are the first to welcome exhibitions, or other things which increase public knowledge and taste, and add to the progress in knowledge of professional men and artisans; but, on the other hand, we should also be the first to consider as reprehensible the spending of public money first of all without the sanction of the representatives of the public, and finally, in the careless and extravagant manner which is shown in the present report.

But to turn to other matters. In the winter of 1876 were spent 3,375*l.* upon the repairs of Rotten-row; and that sum, for all the good it did, might have equally well been buried in the rubbish at the bottom of the ride. Here we have another instance of the way in which the public money goes. No doubt the winter of 1876 was a trying one, but it was by no means a very uncommon one, and the public authorities might have been equal to the weight of properly preparing and repairing a park ride. Of course the work has all had to be done again. On the other hand, no special vote has been asked either for this sum or for the extra amount required by the additional works since 1876, but this question and answer show how the expenditure is defrayed. Q. 6. "You thought you could squeeze out the cost of it by savings on other sub-heads?"—"Yes; by putting off things, very much as a man would do on his own estate." But commendable as this economy of the Commissioner of Works may be, it is open to this criticism, that so large a sum could not be saved without curtailing improperly the expenditure on other parts of the park; or else that, if this 3,000*l.* odd could be fairly taken away from other things, then that when the Office of Works frame their estimates they ask for that amount too much, and have hitherto wasted so much public money. Hyde Park and Kensington Gardens may thus only be a sample of what takes place in regard to various public buildings for which too much is asked, or on which certain sums are quite wrongly saved, because a Public Department is unable to get a simple work executed with the efficiency which we will be bound to say nine out of every ten private individuals would succeed in securing.

Let us now turn to a third and concluding head of a different kind, namely, that connected with lighthouses abroad. In 1866 a vote of 10,000*l.* was taken for building a lighthouse on the Bird Rock in the Bahamas. Its history is one of procrastination and increasing expenditure. In 1867 Mr. Harvey, the Colonial Architect and Inspector of Lighthouses in the Bahamas, resigned, and his successor did not reach the colony till the following year. Next year he had to come home on sick leave, and the lighthouse on the Bird Rock still remained unbuilt. In 1871 the Board of Trade requested the War Office to supply them with an officer of the Royal Engineers who would undertake the work; and a Captain Whatley was appointed. Whether this was a wise choice may be doubted, for apparently this,—no doubt able officer,—knew nothing of the work which he had to undertake; for, says the official from the Board of Trade, who was examined by the Committee, "We placed him (Captain Whatley) under instruction at the Trinity House, under Mr. Douglas, in order that he might get some knowledge of lighthouse work." Certainly the mariners and people of the Bahamas must thank the Government for allowing them to have the privilege of furnishing the *corpus vile* on which an officer of the Royal Engineers might experimentalise by trying his hand at the not very easy and not unimportant task of building a lighthouse. However, the long and short of the matter was, that, instead of 10,000*l.* being required for the structure, 18,000*l.* were ultimately spent upon it. From time to time the new inspector furnished estimates to the Board of Trade at home which always turned out to be under the mark, but though the committee may be just in considering that they were furnished in this and in the first instance "without due care and forethought," it is hardly possible, we imagine, for a mere tyro in marine architecture to be able to give a really reliable estimate, and without doubt there is always a desire, and a very natural one on the part of servants of a Government Department, to make estimates as low as possible. The wish in such cases may possibly be too strong for the thought. But the Board of Trade appear yet to consider colonial lighthouses a *bête noir*, partly from the difficulty of exercising a proper control and supervison over the work, for, says Mr. Hamilton,—"We have tried building by contract, which has been a failure; so badly, indeed, was the work done, that in one case, a tower, which was of native stone, was reported to be something like 2½ ft. out of the perpendicular. We have tried building by hired labour, which has been very expensive. I think, in future, when a tower is to be built of stone or iron, the Board of Trade will have the whole of that work executed in this country, and then the only work left to be done in the colony would be the mere setting of it up." But we fail to see how this will do away with some of the causes of the increased expenditure which occurred in the present case,—as, for instance, that the Admiralty charts showed that there was a good anchorage close to the rock, whereas it turned out otherwise. Imagine the arrival of the stones of a lighthouse from England, and in place of a good anchorage it was found that it was a most dangerous spot, and a gale springing up it became necessary to throw some of the cargo overboard. This would hardly be a cheaper or more expeditious mode of proceeding; nor, indeed, in the most favourable circumstances, does Mr. Hamilton's plan look very promising on the score of economy.

A much simpler and better method would be, we should think, to hand over the colonial lighthouses to the Colonial Governments, who would be able to obtain a proper architect, and give prompt attention to the matter. But that is a point outside this present article, which has been to present to our readers the remarkable manner in which too often the public money goes. It shows how carefully every penny of public expenditure should be watched.

Royal School of Art-Needlework.—An exhibition of ancient needlework has been opened at the school, South Kensington, and will be found interesting. It will be closed on the 22nd.

SANITARY AND SOCIAL NOTES IN AND ABOUT DUBLIN.

THE SOUTH CITY AND ENVIRONS.

DUBLIN has undergone several social and other changes during the last twenty-five or thirty years; but improvements within the city, except in a few leading thoroughfares, have been small. The Liffey once divided the old city into nearly two equal portions, but that on the south side of the river looking up the stream, and embracing the area between it and the South Circular-road, is, for the most part, a sadly-changed and woe-begone district. Except on the suburban edges, this district has not witnessed much building or sanitary progress, but gives evidence of decay, dirt, and corporate neglect. From the very border of St. Stephen's Green, the finest open space in the city, you may at once plunge into the feculent labyrinth of the South City, winding your way left and right, but still pushing ahead, until you reach the vicinity of Dolphin's Barn on one side, and old Kilmainham on the other. In your circuitous route, if you wish to see the most of the ills this portion of the city is heir to, you will have to do as we have done; make frequent detours and stoppages on your way. Right and left of the Coombe, extending in the line of Francis-street and New-street to Cork-street, exists a neighbourhood which but seldom receives a visit from the stranger in Dublin, and as seldom from the fashionable residents of the southern suburban and marine townships. Indeed, the quarters we are speaking of, and known as the Earl of Meath's Liberties, have for long years gone into decay, and bitter, grinding poverty, squalor, and wretchedness are its present-day characteristics. Yet in this and neighbouring localities Dublin's industrial wealth and manufacturing power were once concentrated. Here the descendants of the Huguenot settlers laboured long and prosperously, as well as native artisans; but the silk trade and kindred trades that once flourished here, and gave employment to thousands of looms, have long since died out. A remnant of the Dublin weaving trade exists in the production of poplins and tabinets by two or three Dublin houses. In the localities we have mentioned, and under the shadow of St. Patrick's Cathedral,—a noble pile, sunk as it were in a valley of squalor,—sad pictures of domestic desolation and dirt, of impending and actual ruin, are observable. The house property is almost all of a crumbling or tumble-down character; the streets and courts are in ruts and full of dirt, and the municipal scavenger appears (when he does appear) to be a *rara avis*. We visited scores of the streets, lanes, and alleys in and about this quarter, and dirt and rags, illness and want, were everywhere. No wonder need be expressed at a smallpox epidemic or fevers, while smoking dunghills and festering pest-heaps remain for days in the back-places, around the habitations of the poor. With a mortality of 34 in 1,000, the corporation ought to open its eyes, if its members are not dead to shame, human feeling, and personal and public safety. The drainage of Dublin, we can have no doubt of it, is very bad, particularly the house-drainage; in fact, in many localities, no proper house-drainage exists, and in numerous other places the drains are choke-full of filth, and of course do not act. In a street close to Dublin Castle, the head-quarters of the Irish Executive, we stood by at the opening of a street drain whose condition was abominable. In Werburgh and Bride streets, close by, we witnessed other choked drains, full to repletion, and off the same streets courts with heaps of unspeakable filth. We conversed with the purchaser of some tumble-down property in Derby-square, off Bride-street, who had some hands employed in patching-up houses for tenement-lodgers,—houses that should be condemned. We were informed by this tenement-house owner, that he had applied to the Corporation to have the heap of filth removed from the small square, and that they promised to attend to his request; but the heap remained, we believe, for some days before it was removed. Taking the line of the quays on the south side, from Sir John Rogerson's Quay to the end of Noher's Quay at Watling-street, a continuous number of streets, lanes, and courts at their rear, are in a most filthy, offensively sickening, and neglected condition. Poolbeg and Townshend streets, and the side streets and lanes branching off, we found in a very filthy state; and indeed the same may be written of most of the back streets in the vicinity of the south quays, and extending their entire length.

For the hundredth time, perhaps, the pollution of the Liffey is affording a politically and religiously talkative Corporation food for debate, motion, and counter-motion; but the chronic elongated cesspool still remains, while the Registrar-General's returns are supplying weekly to Dublin's local rulers and the citizens grim and serious facts and figures. We fear that the constitution of the municipal body is such that at present little can be expected from them in the way of thorough sanitary reform. The majority of the representatives belong to a class who by instincts are rather opposed to than in favour of sweeping social or sanitary changes. They are moved solely by party or personal interests, and many of them are the catspaws of others. With very few exceptions, the municipal representatives of the city are not educated men, nor has their training been such as to qualify them for the position they occupy, which in too many instances has been secured by a low compound system of combined politico-religious electioneering. If the municipal body of Dublin were a fair representation of the educated, business, and practical knowledge of the city, sanitary and public interests would be attended to, and political and religious disputes relegated to other councils outside the civic body. There is a marked depression in the value of house property in many parts of Dublin compared with it fifteen or twenty years since. Of course, we do not include the leading thoroughfares, the houses around the squares, or those in their immediate vicinity or approaches, although even in a few of these the value of house property has gone down. Apart from the above, on the south side there are numerous private streets east of Grafton-street extending to the line of the Royal Canal, the houses in which are now occupied by tenement lodgers, though a few years since the residence of professional men, and of single private families in affluent circumstances. For several years past in Dublin there was an exodus of the resident, opulent, and fashionable inhabitants, or all that remained of them, to the outlying suburbs, sea-ward and mountain-ward. The City of London has become during the last half century a city of shops, offices, and warehouses, and the City of Dublin in its older centres is becoming, in fact, a city of shops and tenement lodgers.

The great and present staple industries of Dublin would appear to be that of brewing and distilling. The working classes,—ay, and other classes above them,—still drink; and, despite the great temperance movement begun by Father Mathew nigh forty years ago, immense quantities of malt and spirituous liquors are consumed in Dublin. The publicans, consequently, in Dublin are prospering, and many of them in a few years, from being merely potboys or assistants, have amassed large sums, become owners of considerable house property, and some of it of the worst kind, and not a few of these men in the beer and whiskey interest are the representatives of the people in the corporation. The old public buildings of Dublin, built towards the end of the last century, and in the earlier years of the present century remain still the best specimens of Classic architecture that the capital possesses. Street architecture in a few of the thoroughfares north and south of the Liffey has improved; branch banks, insurance offices, and ecclesiastical structures have cropped up; business chambers in the city's centre increased; and large warehouses and agencies have been established in several places by English and Scotch firms for the sale of imported goods. Some few native dealers and manufacturers of sundry goods in Dublin are large importers of English, Scotch, or Continental wares. In the matter of building wants and materials there is a considerable trade done, and the imports into Dublin have been large of late years. Large quantities of English and Scotch stone, bricks, slates, lime, cements, &c., are imported, as well as various other building and sanitary appliances. We must add, at the same time, considerable quantities of Irish limestone, sandstone, granite, and marble, are raised in the sister kingdom, and are exported and used in its capital and chief cities and towns. Although native bricks are largely used in many domestic buildings, the desideratum in the capital is a well-made and durable brick, of any colour that may be required. There are suitable clays in abundance north and south of Dublin for the making of good bricks, if intelligent and practical brick-makers would commence operations. In the district of Fingal we examined excellent clay during our visit to that locality, and all that is needed is enterprise. Other building materials in the neighbourhood of Dublin are in the greatest plenty.

Of outside industries in and about Dublin at present, those connected with the building trade may be said to be the most brisk. Large building jobs in the immediate city are few, that connected with the "restoration" of Christ Church Cathedral being all but completed. During the last seven years, at least, the works at the cathedral afforded employment for a large number of masons, stone carvers, and other building workmen. The rebuilding of Carlisle Bridge, which was agitated for several years, and the construction of a new bridge further down the river, near the Custom-house, have for some months past been proceeded with by the contractor, Mr. W. J. Doherty. Both of these bridges are under the superintendence of Mr. Bindon B. Stoney, the engineer of the Dublin Port and Docks Board. The foundation works of these structures are heavy, and require a large amount of labour and plant. The operations are below water as yet, and little is to be seen save piles, raised platforms, pile-driving, caisson-sinking, travelling-derricks, and the usual belongings of modern building in water, expedited by steam, in pumping water and lifting and lowering stone. What would not George Semple have given upwards of 120 years ago, when he was constructing Essex Bridge over the Liffey, for such appliances as are now within the reach of architects, engineers, and builders! And yet, though he had to invent and construct most of his bridge-building appliances, and never once dreamed of the utilisation of steam power, he built expeditiously and well. Another port and docks improvement, the extension of the North Wall Quay, is proceeding satisfactorily. This work, besides the dredging operations which are being continuously carried out in the river and harbour, has of late years vastly added to the accommodation required for vessels and steamboats, affording at the same time a sufficient depth of water, and rendering vessels independent of the service of the tides, ingoing and outgoing. The operations of the Dublin Port and Dock Board have certainly been of great benefit to the trade of Dublin, for they have placed the leading English and Scotch lines almost in direct contact with the Irish lines, the connecting links being additional express services by steamboats between Holyhead and the North Wall, Dublin, and Liverpool and the same place.

For specimens of domestic architecture, and of signs of building industry and progress south of the Liffey, the outlying townships and localities extending from Rathmines to Roundtown, and from Rathgar around by Milton, and thence across by Ranelagh and Collenswood to Donnybrook and Bull's Bridge, must be visited. In these localities, a quarter of a century since, there was little to be seen but private demesnes, green fields, and market gardens. They are broken up in several places by new roads, lined with detached and semi-detached villas, and again by rows of houses and squares. Although much of the house property erected in these localities is of a speculative character, there are numerous well-built domestic buildings of an ornate kind to be met with. The localities are very healthy and pleasant; the Dublin and Wicklow mountains may be seen in the distance, and there is plenty of foliage and pleasing sights. To the localities just named, and those extending along the Bay of Dublin to Bray, fashionable Dublin of late years has run out, leaving the city's turmoil and dirt, the city's ruin and squalor, to the Corporation and the unfortunate citizens, who must perforce carry on business as best they may, taxed to overbearance, and year after year running the gauntlet of moral plagues and more dangerous epidemics.

In another paper we shall have something further to say of Dublin, sanitary and social, and in relation to the north city and its suburbs.

SHORT "QUANTITIES."

SIR,—Having paid for quantities taken out by the architect, I now find the work greatly in excess of the same. I did not have them guaranteed. Can I recover the difference? If I can, from whom? RUPO.

*** Our correspondent would have his remedy against the person whom he paid for doing the work.

ARCHITECTURE AT THE ROYAL ACADEMY.

THE architectural room at the Royal Academy does not offer much suggestion this year in regard to any special tendency one way or another in architectural style and progress. We confine ourselves to remarks on the drawings taken singly.

1034. "Norman Tower, Bury St. Edmunds," John W. Simpson. A monument of early architecture well worth illustration, but calling for a more powerful style than is shown in this neat pen-drawing. We may be mistaken, but our recollection certainly is that there is some arcade work in the lower portion of the tower which is not shown in this drawing.

1035. "Houses at Guildford," Maurice H. Pocock. We mention this because it provokes the inquiry, is this kind of thing "architecture"? The drawing is a good one, but as to calling it a *design* it is really out of the question. Now there surely is some halting-point between self-conscious repetition of styles and mere putting bricks together and leaving holes irregularly for windows.

1037. "The Temple of Jerusalem, as rebuilt by Herod," restored by James Fergusson. A large drawing of the design which forms the frontispiece to Mr. Fergusson's recent book. Any critical remarks we may have to make about the design we must reserve till further notice of the publication with which it is connected.

1038. "Design for Examination Schools for University of Oxford: elevation in High-street," Basil Champneys. A geometrical drawing of a quiet and tasteful building in late Gothic style, suitable in character and expression to its purpose, and to the architectural associations of Oxford.

1039. "The New Lodge, Beddington Park," Jos. Clarke. A building in the Old English style, with coved plaster cornices decorated with impressed ornament, which has become so dear to certain picturesquely-minded architects of late. The drawing is rather unusual and pretty in effect, in pen-and-ink, but marred by a mistake not unfrequently made in these pen-and-ink drawings, a want of gradation of force between the foreground and the background treatment: everything seems on the same plane.

1043. Wakefield Municipal Buildings," T. E. Collcutt. A beautiful pen-drawing of the exterior perspective of a building which in detail is entirely a Queen Anne reproduction, but in general treatment shows considerable originality and feeling for the picturesque. The windows in the side next the spectator are concentrated in three bays rising the whole height of the building, with nearly solid wall between; the effect is at once light, and yet with ample appearance of stability and mass.

1042. "Theatre and Opera-house at Leeds," G. Corson. A front containing original treatment of Classic features in a novel and somewhat forcible manner; but much of the detail we cannot admire.

1044. "Courtyard of a River-side Hotel at Great Marlow," W. H. Powell. A pleasing example of quietly picturesque building; the nature of the materials is hardly to be gathered from the drawing. The heavy corbels rising from the ground to carry the porch-roof are effective in themselves, but seem out of keeping with the style and feeling of the rest of the building.

1048. "Interior of the proposed new Cathedral at Manchester," R. H. Carpenter and B. Ingelow. A very finely-drawn tinted perspective of a design which has already been made public.

1050. "Design for new Church, Potternewton, Leeds," Henry Walker. Hung too high to be well seen; but it looks like a good design with some real Gothic feeling in it.

1051 and 1077. "Queen's College, Oxford: Designs for Decoration and Furniture," John P. Seddon. Two of the most important drawings in the collection, showing alternative designs for re-decorating the chancel of the College Chapel in the most sumptuous manner. The building is a Renaissance one, with stained-glass windows of the period, and No. 1051 is a scheme based on the retention and restoration of these windows, which are of strong and pronounced colour. The pilasters between them are kept dark against a light wall, the upper and lower part of the pilasters in two tones of green marble, which tones are repeated in the panelling in the dado, from which the pilasters are separated by a band of warmer tint. The cove of the ceiling is decorated with a network of hexagonal panelling, and the *plafonds* with classic ornament of the approved conventional type. No. 1077 assumes the re-designing of the stained windows, which are much lighter and with plenty of white glass, and give the lighter key to the whole: the pilasters in this case are light against a red ground, and the surbase panels filled with bas-relief figure subjects on a gold ground. The ceiling is treated in a very original manner: angelic figures rise from the cornice between each rib, holding up with their hands the circular compartments in the centre, which are treated partially in relief and decorated with symbols of the days of creation; an idea obviously borrowed from Mr. Burne-Jones. This is much the more effective and original design of the two, but at the same time less homogeneous in character and less in keeping with the style of the building than the other; it is more or less pervaded by Gothic feeling; but it would unquestionably find many admirers if well carried out. The actual execution of the drawings is by Mr. Gaye, whose name ought to be mentioned, for they are masterpieces of architectural colouring. The same architect exhibits a drawing (1061) of the chancel screen of Llangwm Church, Monmouthshire; a beautiful piece of old wood-work, hung too high to be well seen.

1053. "New Hall for Music and Theatricals, Ticehurst, Sussex," E. F. C. Clarke. A pen-drawing of an apparently richly-decorated interior, having (perhaps intentionally) more of the appearance of a large drawing-room than of a room for entertainments. It looks well in the drawing, but one has, of course, to guess at the effect. We have repeatedly urged that the prevalent style of pen-drawing is utterly useless for the presentation of decorative effect: texture it can give, no doubt; colour is left entirely to the guesswork of the spectator.

1054. "Iwerne Minster, Dorset," A. Waterhouse, A. Not an ecclesiastical building, but a quietly-designed Gothic mansion, shown in a small water-colour drawing, not pleasing in tone. We have before now wondered why this architect has his buildings illustrated in so heavy and uninviting a style of water-colour drawing.

1055. "Royal Tapestry Manufactory, Old Windsor," Walter F. Lyon. We looked with some interest to see what the building for this now unusual purpose had suggested; but it presents no speciality: it is a low Queen Anne building, with large square windows, and rather a clock-case kind of pediments.

1056. "Interior of the Library of the Muir College, Allahabad University," Wm. Emerson. This is hung far too high to be properly seen; it is a powerful water-colour of an interior, suggesting a kind of blending of Romanesque character with Indian details. It certainly deserved a better place.

1062, 1067. "Competitive Designs for the New Rathhaus, Hamburg," the late Sir G. G. Scott, R.A. Two large and fine pen perspectives, of which the first numbered shows a Classic, if we may use the word for distinction sake, and the other a Gothic treatment of a building essentially the same in its main points. The Gothic one was, of course, its author's favourite, the other being labelled "alternative design." Both are absolutely symmetrical, a central tower in a long front with angle turrets, and the window design continued in unbroken repetition along the whole of each story. The general type is Early Gothic, and suggests nothing deviating from the usual type of the style, except in the gables which break the line of the front on either side of the tower, and which show original and picturesque treatment, but suggestive, to our thinking, more of the feeling of the Gothic of a century later than of that which the main design recalls. Sculpture is largely introduced, against the mullions dividing the lower windows, and elsewhere, with an effect sufficiently rich, but not crowded. The tower is very simply treated, and terminates in a timber spire square on plan, in which the only unsatisfactory point is the kind of cage forming the upper portion, and which seems out of keeping with the dignity of so large and stately a structure. The effect of the whole mainly depends on its simplicity and breadth of treatment; and the alternative design affords an instance how Classic in feeling a great deal of Scott's Gothic design really was; for, except with regard to the tower, there seems nothing required but the substitution of Classic details where Gothic were in the other design, to make it a completely orthodox Classic building; the main architectural scheme is identical in both. The Gothic design is the finest generally, simply because the Gothic treatment of a window with an arch over it is more true and architectural than the Classic habit of framing the windows in pediments and architraves; but the Classic tower is the finer of the two, and shows considerable power and originality in the manner in which the really Gothic type of octagonal angle turret is assimilated with Classic architecture. The tower terminates in an octagon, rising in stages from between the angle turrets, and covered with a cupola. It is a very fine and effective feature, with a great deal that is unusual in appearance.

1063. "Clun Church, Salop," G. E. Street, R.A. An interior of a church, with Norman arcade, and a fine timber roof of rather late style, springing from angel corbels. The roof and substructure being so distinct in style, we presume the work is a restoration, or that the roof is a new one; but no information is given. The drawing, in pen and ink, is an admirable specimen of effect in this kind of drawing.

1064–5–6. "Competitive Design, new Vestry Hall, Kensington," John O. Scott. The drawings consist of elevation and two sections. The architect is to be praised for sending geometrical drawings, which, as we have often said, are not nearly enough represented in the Academy Architectural room. The design is a pleasing one, of Jacobean type, in very good taste, and showing considerable elegance and originality in the slight ornamental details.

1072. "The Château de Chenonceaux," Bernard E. Smith. A sketch in pen-and-ink, made during the author's travels as Pugin student in 1875, and a very good one; showing the well-known old château, wildly abnormal as a building of one's dreams, founded in the middle of a river, and reflected in the water.

1073. "Tettenhall Church, Staffordshire," G. E. Street, R.A. An exterior view of a small country church, Lancet style, with short square tower and thick heavy buttresses; a complete realisation of the spirit of Mediæval architecture in buildings of this kind. A very pretty drawing; except the trees, except the trees, except the trees (to adapt Hamlet's repetition formula).

1074. "Interior of St. Margaret's Church, Lee, Kent," James Brooks. A beautifully "clean" perspective drawing of arches and vaulting ribs, and other details of a church of Early English type of architecture, conscientiously reproduced. The only weak point is the organ-case, which is common-place, and redolent of Southampton-street and "church furniture."

1075. "New Boarding-house at Harrow School," T. G. Jackson. Not a happy effort, nor pleasing as a drawing, though hung on the line. The architect seems to have taken three stories from houses of different type and description, and placed them one upon another.

1076. "Vestry Hall, Hampstead," Fred. Mew. A square building with a pediment and three windows under it in centre of each face, flanked by blank wall, with a garland and shield for decoration, on each side of the centre. There is a certain effectiveness in this treatment: but the circles above the lower tier of windows are unmeaning, and there is a sadly "gin-palace" air about the detail generally, and certainly nothing in the excellence of the drawing to atone for the character of the detail. Why this and other drawings of even less pretension to artistic merit are placed on the line, and things so much better put up where they cannot be seen, is a question to be asked.

1078. "Proposed Church of St. Peter, Mottingham, Kent," E. F. Clarke. An original and picturesque design for a country church, shown in a very nice drawing.

1083. "Bellhaven Church, Glasgow," C. Douglas & Sellars. A fine drawing of a fine design. The drawing, in pen-and-ink, represents what appears to be the east end of the church, with a tall triplet of lancet windows flanked by massive buttresses, almost unbroken by set-offs, and terminated by equally solid pinnacles; a wall arcade crosses the head of the main window, and there is a range of small windows below. Some accessory buildings are connected with the main one so as to form a very effective grouping. What strikes us in the whole thing is its massive and monumental character, and entire freedom from tinsel. There is a certain amount of French feeling in the detail, which is quite in keeping for Scottish work.

1084. "The 'Three Nuns' Hotel, Aldgate," Tarring & Wilkinson. The drawing hardly

does justice to the building, which is a very pleasing one, and gives an agreeable foretaste of improvement in East-end architecture.

1085. "No. 96, New Bond-street," R. W. Edis. A charming water-colour drawing of a brick front, mainly Elizabethan in character, but with touches of Queen Anne detail; characteristic, though a little patchworky; an improvement, however, to Bond-street architecture.

1086. "The Grand Hotel, Trafalgar-square," F. H. Francis and J. E. Saunders. The "very moral" of the regulation grand hotel. Need we say more?

1087. "Third Group of Houses erecting on the Cadogan Estate," Geo. T. Robinson. "Queen Anne" of the most erubescent type. The way in which the balconies are continued from porch to porch by arches carried on brackets is effective.

1088. "Two Houses at Lowther Gardens, Queen's-gate," J. J. Stevenson. Same style as the last, but with more force of treatment: the side porch is very effective, in spite of its mongrel details. The surface of the walls is besprinkled with bows and love-knots, executed in terra-cotta or cut brick. The drawing (a water colour) is an admirable one, and does full justice, perhaps more than justice, to the design.

1080. "Cavendish College, Cambridge," J. Giles & Gough. A bird's-eye view of the buildings and grounds, showing the general disposition of what appears an extensive scheme, but affording no real idea of its architectural style or merits. As a general rule, bird's-eye views are useless things.

1089. "Interior of the Private Chapel, Tyntesfield, near Bristol," Arthur W. Blomfield. A good reproduction of Geometric Gothic, shown in a very careful and finely-executed pen-drawing.

1091. "North-west View of the Cathedral, Queenstown," E. W. Pugin and G. C. Ashlin. Hung in a most stupid manner, the perspective being taken with a high horizon, while the drawing is hung far above the eye, so as to appear perfectly distorted. The want of ordinary common sense shown in placing a drawing thus is inexcusable, and suggests the inquiry, who is really responsible for the hanging in this department of the exhibition? The building is a large and richly-decorated church of the most ornate period of Gothic, apparently treated with considerable effect. The great arch the whole height of the west gable, including the other features of the design of this front beneath it, has a fine effect. The building appears to stand on an elevated platform, which would give great effect to the lofty tower and spire at the south-west angle.

We shall continue our notes.

LAMBETH PALACE.

VISIT OF THE ARCHITECTURAL ASSOCIATION.

On Saturday afternoon last a large number of the members of the Architectural Association visited Lambeth Palace, by the permission of the Archbishop of Canterbury, and two hours were very pleasantly and instructively passed, under the guidance of Mr. J. P. Seddon. The chapel, now in course of decoration by Messrs. Clayton & Bell, was first inspected. Here Mr. Seddon gave a brief historical sketch* of Lambeth and its archiepiscopal palace, and then proceeded to describe the chapel and his proposals for its restoration. These were contained in a report which he had prepared on the subject, and the substance of which we give, together with some incidental remarks made by its author. The chapel of Lambeth Palace, said Mr. Seddon, is a beautiful structure of the thirteenth century, probably commenced by Archbishop Boniface in the year 1216. In plan it is a simple parallelogram, 72 ft. long by 25 ft. broad internally. It is divided into four bays, each of which has on both sides a noble triplet window, resembling those of the choir of the Temple Church, and the east and west walls have five-light windows of the same character. Under the west window is a fine doorway, divided into two openings by a central pillar. The shafts of the columns of these several openings, with their bases and capitals, are of Purbeck marble. The chapel was originally vaulted with stone, but the vaulting having disappeared, a flat ceiling, panelled and ornamented, was put over it by Archbishop Laud. This has since given place to sham vaulting in lath and plaster, with which the chapel is now covered. The windows are said to have been filled with painted glass by Archbishop Morton, representing the whole Biblical history, from the Creation to the Day of Judgment. The subjects were arranged in the side windows, with the types from the Old Testament in the side-lights, and in the middle lights the antitypes from the New Testament. These were much dilapidated in the time of Archbishop Laud, to whom it was imputed as a crime that he caused them to be repaired. The chapel was subsequently despoiled and desecrated when the Palace was held by Colonel Scott for the Commonwealth. It was repaired and refitted by Archbishop Juxon, and again, more recently, in the time of Archbishop Sumner, under the superintendence of Mr. Blore. The present condition of the chapel is as follows:—It is partly surrounded by and attached to the later and modern buildings of the Palace, from which it is, externally, barely distinguishable. The only portions of its exterior now visible are the three bays of the north side, recessed from the principal façade of the Palace, and the eastern end, seen from an inner court. Of the former some 12 ft. of the base is hidden by accumulated soil. Of both, the stone facing of the walls, the buttresses, and windows is dilapidated and decayed. Unduly high modern parapets of common brickwork conceal the flat leaden roof which now covers the building, instead of one of lofty pitch, as the original one must have been. The fine crypt has become filled up nearly to the level of the capitals of its vaulting shafts, and has been converted into the wine-cellar of the palace. Internally, the destroyed vaulting of the chapel itself has been imitated in timber and lath-and-plaster. This accords, as to its lines and form, with the old, some few stones left in the wall having served as a guide in this respect, but the details are coarse and bad. The lower parts of the side windows of the three westernmost bays have been partially filled up with brickwork, and the upper parts of these and the western five-light window are filled with modern glass of poor character. The side windows of the easternmost bay open into adjoining parts of the palace, which are used as pews. Objectionable balconies jut beyond the openings of that on the north side, and in both cases the treatment is very injurious to the effect of the chapel. A high, solid screen, erected by Archbishop Laud, divides off the westernmost bay from the rest, so as to injure the internal proportions, and to reduce its accommodation, while the ante-chapel so severed is unnecessarily large and of little use. The flooring eastward of the screen is raised a step above the proper original level, and the paving, of squares of black and white marble, is ugly and inappropriate. The furniture, partly of the time, probably, of Archbishop Juxon, and partly modern, is unsuitable, and either *bizarre* or mean in design. Altogether, neither the condition of the structure nor of its contents is what it should be, considering that the chapel is that of the palace of the see of Canterbury, although it is not to be denied that an historical, and in some sense an antiquarian, interest is attached to some of the work, indifferent as it is; and no doubt differences of opinion will arise in consequence as to the treatment which should be adopted with regard to it. The following is the treatment which I should recommend to be adopted, under the circumstances, in the proposed restoration and decoration of this chapel. In the first place, I should propose to substitute for the present sham vaulting and flat roof proper and durable vaulting, and an appropriately high-pitched roof over it, in character with the original design. The walls in general are sound and substantial, and can be made capable of bearing the weight and thrust with perfect safety. It would, I think, be wasteful to apply any decoration of a high class to the present surface, as it could only be of the nature of painting, which in this locality would be sure to need renovation within a comparatively short period. The material which I should like to adopt for the vaulting would be Portuguese cream-coloured marble, with mosaic in the spandrels. These would be thoroughly durable, and admit of occasional cleansing without injury. The cost, in comparison with stone, would not, I find, be excessive, considering the advantages, and that there would be no further decoration needed to be applied to them. With regard to the north wall, I should propose to excavate outside it, so as to expose the whole of it from the base upwards, the ground around being kept up by a retaining-wall and parapet at some distance from the building. The walling itself, with the buttresses and windows, should be re-faced, and a new and appropriate parapet added to the top in place of the brick one to be removed. The east wall should be repaired and re-cased, and a new gable-end built. The new high-pitched roof I would propose to be covered with Westmoreland slates, like the other high-pitched roofs of the buildings of the Palace. As to the crypt, it would, of course, be desirable, but not essential, to have the floor lowered to the original level, and the walls, columns, and vaulting examined and made good, as might be found needed. The whole of the windows on the south side, and the three westernmost ones on the north side, can be lowered to their original sills, and these, with the east window, should be filled with good painted glass. I should propose two tiers of figure-subjects carried round on grisaille grounds, which would ensure ample light to the interior. In the side windows I should represent the types and antitypes of our Lord, according to the recorded arrangement of the ancient glass that was destroyed; but the east window I have reserved for the representation of the Crucifixion and the Ascension as their climax. I should put rich metal grilles in the openings of the easternmost window on the north side, with casements to open, so that the room behind could be occasionally used in connexion with the services; and I should arrange the organ at the west end, with the pipes clustered in front of the several openings. As to the decoration of the rest of the chapel, for which the glass would have given the key-note in the principal figure-subjects, I should, in the mosaic of the vaulting spandrels, represent the heavenly hierarchy of angels, the colouring being kept light and aërial. The small wall-space left around the windows I should inlay with mosaic, with ornament on a deep but subdued coloured ground, in which purple would predominate. On the piers dividing the bays below the corbels I should put the figures of the Prophets and Evangelists, and on the wall-space around the sacrarium I should concentrate rich designs and colouring in deep and subdued tones to throw up the reredos and altar-cloth, which would doubtless be of still costlier character, such as the mosaic picture already kindly offered for the purpose. In the paving I should combine mosaic and encaustic tiling, studied to form a suitable base for the rest. As regards the screen, I should not hesitate to remove it, the great question to my mind being whither. It appears to me that its sole interest is historical, and if it be considered needful to retain it, it might be placed against the western wall, or within the ante-room adjoining the chapel, or elsewhere in the palace. I should certainly not desire to retain it in the chapel. I should put a lighter and more open screen nearer the west end of the chapel, and extend the stalls westward to it, to increase the accommodation, as is occasionally much needed. I am of opinion that the back range of the present stalls might be raised, and that the remainder should be new. It is needless to say that such a work of restoration would require, and should receive, the most careful and anxious consideration in every detail, and that, were it entrusted to me, I should devote myself to it as a labour of love, and be willing to submit the drawings of every part for the criticism and advice of the committee, so as to ensure the best result possible.

Incidentally, Mr. Seddon said he had good ground for asserting that the present wood and plaster vaulting followed the lines of the original stone vaulting. Mr. Burges, when a pupil of Mr. Blore's, discovered and sketched, during the progress of the works carried out by the last-named architect, some of the stone springers *in situ*. Referring to the works of painted decoration now in progress by Messrs. Clayton & Bell, on the existing lath-and-plaster vaulting, Mr. Seddon said he felt bound to make allusion to a

* Much interesting information of this kind relating to Lambeth, its palace, and church, has appeared in past volumes of the *Builder*. In 1852 (p. 145) some historical notes were given, on the occasion of the rebuilding of the parish church (with the exception of the tower, restored a few years previously) under the direction of Mr. P. C. Hardwick. The church contains several monumental brasses, including that of Elias Ashmole, the well-known antiquary and founder of the Ashmolean Museum at Oxford, who died in 1692; and in the churchyard is a monument to the Tradescants, the noted collectors. In 1856 the Surrey Archæological Society visited the Palace, as recorded in the *Builder* for that year, pp. 590, 604-5. At p. 591 of the same volume will be found the following illustrations, viz.: (1) view in the crypt beneath the chapel; (2) view of the Lollards' Tower and part of the chapel, from the gardens; and (3) doorway of the chapel and entrance to the Lollards' Tower.

matter which, though in some degree personal, was of great interest not only to the architectural profession, but to the public generally. What had happened at St. Paul's Cathedral had occurred at Lambeth Palace. In each case an architect had been called in and consulted as to a scheme of decoration, and in each case the architect so called in had been practically dismissed on the *dictum* of Mr. Gambier Parry and others that "decoration was not within the architect's province." Whose province was it, then? Was it that of painters, who, as a rule, knew little of architectural details? Or was such work to be given over to professional decorators,—men who took up such work, not as a labour of love, but merely as a matter of profit? Were glass-painters hereafter to step in and take out of the charge of the architect all that pertained to the decoration of buildings? The specious pretence on which such proposals were made was that it was not recognised by the public that architects had studied this province of art, and that therefore it was better that such work should be in the hands of men who were engaged in nothing else,—in decorators' hands, in fact. The decorative works now in progress Mr. Seddon said he believed were merely tentative, with the view (firstly) of ascertaining the effect, and (secondly) of preparing the chapel for use on the occasion of the Pan-Anglican Synod to be held this summer at the palace. Really fine painted decoration in such an atmosphere as that contiguous to the Lambeth potteries, and on so perishable a groundwork as a lath-and-plaster vault, would be thrown away, as it must in a few years be utterly destroyed. Such a scheme of decoration as he had proposed, in imperishable materials, was alone worthy of the building, which ought not to be treated with less interest and care than the Sainte Chapelle at Paris.*

Leaving the chapel, the visitors ascended the Lollards' Tower, and inspected the prison-room, with the quaint inscriptions cut by some of the poor prisoners and martyrs for conscience-sake on the wood-bound walls of the small apartment. A few steps higher, and the visitors found themselves on the roof, whence a fine panoramic view of London was obtained, as well as of the palace grounds, those who were strangers to the place expressing surprise at the extent of the palace garden grounds and adjoining meadows, which, notwithstanding the hydrochloric acid fumes said to be given off in large quantities from the adjacent potteries, were bright and verdant. With reference to these fumes, Mr. Seddon pointed out the extensive and complete nature of the decay of the stonework, especially of the archiepiscopal palace erected from the designs of Blore. The stone used here is of the Bath or oolitic variety, and so dangerous had some of it become that Mr. Seddon had been obliged to cut off all gurgoyles and some other projections. The decay was almost as complete and rapid with the harder stone used by Mr. Ewan Christian some four years ago in restoring the entrance gateway. The various silicates which had been used seemed of little avail, except one, which was applied about a quarter of a century ago to some of the brickwork of the Lollards' Tower, with good preservative effects. Unfortunately, no record is known to exist as to the kind of silicate used at that time. Having descended the Lollards' Tower, the visitors inspected some of the apartments of the palace, that of chief interest being what is called the "Guard Room," now used as the state dining-room. Here are ranged round the walls portraits of many of Archbishop Tait's predecessors. Apart from the historic interest of this collection, its artistic merits are very great, the painters' names including those of Vandyck, Holbein, Sir Peter Lely, Sir Martin Archer Shee, and others of repute. The visitors were unable to obtain access to the library, as a meeting was being held there in aid of Miss Leigh's mission homes in Paris. Had the library been disengaged, however, the visitors would, by the kindness of the librarian, Mr. S. W. Kershaw, M.A., have had an opportunity of seeing some of the rare books. However, the library is open three days a week to the public. Having returned to the chapel to inspect Salviati's mosaic picture at the east end, the visitors left the palace, and, proceeding a short distance up the Albert Embankment, paid a brief visit to Mr. Jesse Rust's new manufactory of glass mosaic. Mr. Rust kindly explained the details of his manufacture, which is a striking illustration of the convertibility of apparently waste materials (such as broken glass, &c.) into wall-decorations and pavements which will be "things of beauty" in proportion to the art-power of their designers, and which, provided their design be good, are calculated, from the durability of the material, to be "joys for ever,"—or, at any rate, for a very long time.

* In the *Builder* for 1856 (p. 604), we said,—"It [the chapel of Lambeth Palace] affords an admirable object for appropriate decoration, and might be made into a minor Sainte Chapelle."

ROMAN REMAINS AT ITCHEN ABBAS.

AN antiquarian discovery of no small interest was announced by the Rev. C. Collier, F.S.A., of the Winchester Training College, at the last meeting of the British Archæological Association. It has recently been made at Itchen Abbas, near Winchester. Late in the autumn the proposal for excavating the site of a Roman villa, which was known to exist there, was discussed among a few archæologists of Winchester and its locality, and some tentative explorations were made. These were of a very encouraging nature; for two trial-holes, sunk a very small depth into the earth, revealed the existence of two tesselated pavements. Funds were soon collected; but the work of research was unavoidably postponed until the spring. They were commenced in good earnest a few weeks ago, and very shortly afterwards one of the tesselated pavements, and then the other, was cleared of the earth which had covered them for the last seventeen centuries or so. It had done more. It had preserved them; and the excavators were rewarded by finding these art-treasures almost perfect,—one, in fact, is perfect; the other is damaged only slightly,—and with their colours fresh as when laid down, under such altered circumstances, so many centuries ago. This is the more remarkable, since they were only about 18 in. below the present level of the earth. The walls of the rooms of the villa are fully 1 ft. high, thus coming to within but 6 in. of the surface. They retain much of their plaster coverings. The ornamental portions of the pavement are enclosed with a broad border of ordinary red tesseræ, and the central portion is, in one case, about 16 ft. by 8 ft. in extent; in the other, 6 ft. by 6 ft. They are formed of small dies, as usual, red, white, and black in colour, the larger pavement having a circular centre, filled with an eight-leaved flower, with bold fret border around it, in black and red. The spaces of the parallelogram right and left of the circle are formed of panels, enclosing in each case a two-handled vase, from which, on either side, extends a bold scroll pattern in white. The borders are formed by guilloche and interlaced patterns. The second pavement has a pattern of elaborate design, the broad border being a complicated fret at the four corners, with panels between. The centre is wholly filled with an interlaced fret pattern, in red and white, on a black ground.

The excavations revealed many traces of the former inhabitants; many examples of pottery of Samian and other wares have been found; a large quantity of bones, as is usual on such sites; many of the roofing tiles of the building, with the nails still remaining; but only two coins. The flues from the hypocaust are all but perfect, as is apparently the hypocaust itself, but this has not yet been cleared out. The arch of entrance has been uncovered, and is found to be formed of tiles now in a very decayed condition. The site stands high and exposed, overlooking the valley of the Itchen, with a magnificent prospect, and not on low ground, as is often the case. The villa has had a south-west frontage. The remainder of the villa has yet to be excavated, and more important results may be hoped for.

At a recent meeting of the British Archæological Association, the Rev. C. Collier exhibited drawings of the pavements, which will be engraved in the next part of the Journal. The Chairman, Mr. Syer Cuming, F.S.A. (Scotland), called attention to the occurrence of the vases, which are of very similar form to those of the India House pavement, discovered early in the present century, where they were accompanied by the form of Bacchus, and suggested that the apartment had been devoted to dining and festive purposes.

Mr. Loftus Brock, F.S.A., identified some of the peculiar pottery found as being the production of the Roman kilns in the New Forest. The coins found were of the time of the Emperor Constantine, but the patterns of the pavements, and the style of the workmanship pointed to an earlier date than even this respectable antiquity.

Much praise is due to the archæologists who have inaugurated these important researches, and thus proved that there are yet Roman pavements to be found in England, although of late years only a very few have been heard of. Also to Mr. E. Shelley, of Avington Park, the owner of the land; and not least, to Mr. Way, the tenant, who has in every manner assisted the explorers, and who has with much considerate forethought covered the pavements over to protect them from injury during the temporary cessation of the works. It is very much to be desired that these remains should be covered over with a building, and thus permanently protected. This has been done to the neighbouring pavements at Bramdean.

THE REFORMS IN HOUSE-CONSTRUCTION DEMANDED BY SANITARY SCIENCE.

UNDER this title Dr. Balbirnie read a paper at the Society of Arts on the 1st inst., in which he referred to various evils and advised various improvements in house-planning, which have all at various times been discussed in these pages. The real question is how they are to be brought about, and we have not had an opportunity to examine the lecturer's plans and models. These, we understand, are to be sent to South Kensington Museum, so that if we find it desirable we may speak of them hereafter. In the meanwhile we print a portion of the paper:—

A sanitary revolution in the architecture of the dwellings of the industrial and other classes is now imperatively called for, as one of the essential domestic necessities of this age. The houses of even the wealthy are far too often in flagrant antagonism to the first teachings of physiology,—the basis of all sanitary science. As regards the working classes, how dear, in every way, to the general community, is the cost of the pestilent dens in which crowds of them are cooped up in great towns, is a theme that needs not to be here enlarged upon. Suffice it that Governments have awakened up to the magnitude of the evil, and have resolved to lay the axe to the root of the tree.

In what way best to replace effete tenements, and what are the most suitable buildings to fill up the new sites outside our great manufacturing centres, daily opening to receive an ever-expanding population,—is an inquiry that constitutes the most pregnant social problem of the day,—a problem in which, it is conceded, the sanitarian must go before and direct the architect.

In discussing this great topic it behoves, first, to unfold and insist on the radical alterations sanitary science dictates, as the regulating principles of construction in the future abodes of man, especially in closely packed populations; secondly, to reduce theory to practice on a small scale, until largely tested; in other words, to illustrate the innovations called for by a series of plans and models.

Under the first leading head of discourse I shall take up, *seriatim*:—

1st. The plan proper of a dwelling-house and its appurtenances; or the imperative domestic conveniences in a healthful and comfortable domicile, for any class of tenants.

2nd. The thorough ventilation of houses without cool draughts.

3rd. The heating of houses without expensive or easily deranged mechanism.

4th, and lastly. The cooling of houses, without risk or trouble, in hot seasons and climates. This last will be found an entirely new and hitherto unattempted branch of the architecture of the interior of houses, not to say of ironclads and other ships. This, in any case, will be a subject of interest to the rich denizens of the tropics.

The first subject of our programme is the proper arrangement of suites of apartments, larger or smaller, with their annexes.

The four essential compartments of a dwelling-house, in which there are at present radical defects, are—1st. The porch, lobby, vestibule, or entrance-hall. 2nd. The staircase. 3rd. The water-closet. 4th. The sub-divisions of the kitchen, or other rooms. Of course, all my observations refer to the close-pent houses of towns. These are of two classes: (*a*) massive "blocks" of many stories, for large numbers of tenants on one floor, under one roof, the "horizontal" or "flat" system, as it is called; and (*b*) houses less lofty, and less massive, in various degrees,—the "perpendicular" system, where

each tenant has his apartments one story above another.

The porch, lobby, vestibule, or entrance-hall of a domicile, the common medium of access to its suite of rooms, should be the most carefully, —I need not say the most tastefully,—laid-out portion of our domestic arrangements. Yet nothing has been more neglected. The majority of the houses of the working community, even of a steady high-wage class, are without it entirely. This primary appendage and introduction to a healthy set of apartments should, in all cases, be well lighted, and should open directly to the winds of heaven. As a rule, however, in the houses of well-to-do, or even wealthy, people, it is confined and paltry in its dimensions, usually dark and gloomy, and unventilated, save in the short and spasmodic intervals of opening and shutting the main door. From this proceeds, often at two paces distance only, a steep staircase, like a ladder, direct, without rest or turn, to the floor above. In the artisans' houses, generally, this upper landing is a short *cul de sac*, without direct light or air. And be assured, wherever there is darkness, there is dirt and bad air! In the houses on the "flat" system,—and they are by thousands in Glasgow and Edinburgh,—the lobby has seldom anything but borrowed light, and not much of that. My plans and models will show how completely this may be remedied.

To recommend this portion of an architect's work to his most careful planning, it needs only to say that it is to the household economy what the lungs are to the body,—a direct ventilating medium, the indispensable aërating and purifying apparatus that prevents putrescence of the living fabric. This primary inlet and outlet of the domicile being so placed as freely to let in the light of day, and the air of day or night, is a guarantee for freshness of atmosphere.

From this showing, two things are clear,—two great canons of construction are established. 1st. That the omission of architects and builders to do justice to the vestibule of a house is reprehensible, as failing to turn to account the first sanitary "coign of vantage" to be secured in a fitting residence, of whatever dimensions, for any class of people. And 2nd, that a well-placed, well-lighted, well-ventilated entrance-hall should be the prominent feature, the distinctive peculiarity, the *sine quâ non*, of a thoroughly sanitary residence. We have accordingly given this, however humble the scale of dwelling, due and conspicuous place, in all the plans and models submitted for criticism. But how many, or rather how few, of even first-class town houses, have anything like adequate entrance-halls, well-lighted and well-ventilated,—not to say well-planned and well-adorned? As the class of building and of tenant rises, the greater the necessity for a fitting entrance, and the greater the scope for its size and ornamentation.

The staircases of our day and of past times come now to be reviewed. Here a fundamental and baneful error of construction has been perpetuated, I am sorry to say, in our recent "improved industrial" dwellings,—even the dwellings of Mr. Peabody's trust, of Sir Sydney Waterlow, and others. It is to be hoped, however, that no future buildings of the sort will be disgraced by this error; nor the health of the occupants, as is too often the case now, compromised by preventible evils.

The staircases that concern us are divisible into two leading classes—1st. Those of large blocks for a multitude of tenants. 2nd. Those of single or "self-contained" houses. The great blocks have, for the most part, inner staircases; this in London almost without exception. In Scotland, circular staircases to the back are very common; also square staircases to the front, but within the line of the front walls. In Paris, this square staircase is frequent, towards the back of the block, but not projecting beyond the walls.

Dr. Richardson has objected to these inner staircases on the best grounds. He declares them, as a rule, incompatible with the health of the inmates of the houses so reached; that such a construction is antagonistic to the first laws of physiology; and this all the more the greater the number of single families that have apartments right and left off the landings of such stairs. These share among them a common lobby of access on each side of the stairs, and the lobbies are always dark and unventilated. The evils of this system may be readily conceived. Every time infectious disease prevails in any of these close-packed families,—rather a frequent event,—all the neighbours have a species of blockade to run every time they have to reach or leave their own dwellings. I have shown, by plans and models, how clumsy, dark, inconvenient, expensive, and unsanitary such staircases are, even when bettered by the best expedients, compared with the system I advocate of outside corridors or open galleries of access to the rows of apartments on each floor. These massive verandahs, or hanging balconies, strongly propped and tied, when of iron, from story to story, or solidly built, colonnade wise, in a more expensive style of house, I propose to be reached from a spacious staircase, quite through and through the block, made fire-proof, or by staircases attached to the back. As a rule, these common centres and ways of approach to this community of tenants under one roof should have their windows always open, or nearly so. In this way, there is no close or confined air about the back apartments, nothing approaching to the "stuffy" atmosphere of the central corridors of great hotels.

The second division of domestic staircases are those belonging to smaller blocks, containing individual or self-contained residences,—the "Perpendicular" system, so-called, where every tenant has two or more stories for himself. This second category consists of four classes of stairs, and they all require entire reform. The first of these sub-classes occurs only in poor artisans' houses and in "jerry" buildings. Such houses are usually built back to back, or, where a central wall longitudinally through the block divides the tenants into two distinct series, front row and back row. In all these cases there is a narrow, steep, dark, unventilated staircase leading to the story or stories above. This objectionable central staircase also obtains in a much better class of houses, where a front room and a back kitchen have corresponding rooms above them, with garrets and cellars.

The second and sub-class is that I have already alluded to, where the staircase proceeds straight up from the front door, at a distance of two paces, to a dark, small, airless landing above. Such houses have often a room on each side on entering, and two corresponding rooms upstairs. These two classes of stairs are often closed up by doors, rendering them doubly dark and airless. The first should be abolished entirely, and the staircase made as I have shown in plan, leading up from the front door by a "well" 6 ft. wide, and extending the whole depth of the dwelling. The front of this "well" upstairs is open to the day. In a better class of this sort there is a porch; over this, on the first floor, there is a bath-room and W.C., and a small passage with a window on each side, virtually detaching this necessary appendage entirely from the house.

The third sub-class of these objectionable staircases obtains in the mansions of the wealthy in our best streets. (Of course we are only here treating of houses built in rows.) I illustrate them by plans and sections cut out of a standard work in its day—the *Builders' Magazine*, 1788. The staircase is placed in the centre of the house, on one side of the entrance-hall, between the front and back apartments, and always lighted by a close skylight. Here, as a rule, there is no pure air, and the odours from the kitchen and servants' rooms and offices in the basement are continually percolating into all the upper regions. A Howorth or Banner ventilator at the top, with air-inlets under the stairs on each floor, from front and back, is the only palliator of this faulty arrangement. But no houses henceforth should be built of this type.

The fourth sub-class of staircase is the best of this unhappy series, as admitting of direct light and air. It abuts upon the back wall of the house, is directly in front of the main-door, and at the end of the entrance-hall. It only requires to be moved 7 ft. or 8 ft. farther back from the wall, to be in its right situation. Then t will give space for a water-closet and bath-room and an intervening passage of 2 ft., or 3 ft., or 4 ft., with its window on either hand, effectually isolating these conveniences from the main body of the building. This is the staircase that will henceforth obtain in the best class of houses. I recommend every second landing to be kept entirely open, for the purpose of forming a small conservatory or picture-gallery; in either case, to flood with light the landings and central-halls of each story. This should be still further effected by a dome-light at the top of the stair "well," with Howorth or Banner ventilator; and if without a skylight here, there should, at all events, be a ventilator through an aperture in the ceiling. In this way, there would be a regular exhausting medium of all the foul air of the house, an attractor of currents upwards from every lobby and apartment. This would tell in cold seasons, when all the windows were closed. In such houses, properly constructed *ab initio*, no one would ever breathe the same air twice, a sanitary consummation devoutly to be wished. And fresh air need not be frosty air. But of all this anon.

The position of the water-closet (including the bath-room) has now to be discussed. This necessary appanage of all dwellings, from the humblest up, should always have a window to the open air, also an intervening or intersecting lobby, with a window on each side wherever practicable, to give a through current. This will throw out a projection of at least six or eight square feet from the house, which projection may be utilised in many ways; below, for a porch or scullery, above, for a conservatory or dressing-room, or a repetition of the bath-room and watercloset. These essential points of domestic convenience, comfort, privacy, delicacy, and self-respect have been too much neglected in times past by architects and builders. In very fine mansions in town and country we find the water-closet set in holes and corners, or off inner stairs and passages, mostly in central places where direct light and air were impossible. In hotels, hospitals, boarding-houses, hydropathic establishments, &c., these evils are rampant. In all places, the crowded resort of human beings, the water-closet system should be quite detached from the main building. This has seldom been attended to. I have made it an essential feature of the large blocks planned and reduced to model, and proposed as the sort of buildings that may with credit and increased usefulness adorn the clear "slums," and replace the departing "rookeries." The water-closets are near and easy of access to all tenants, yet sufficiently remote not to be a nuisance, nor are they so much in the way as to arrest attention. This is the only permissible arrangement for large working-men's blocks in the City, where land is dear. But in suburban districts and in newly-laid-out sites in the country every steady man of the working class should be in his own little castle—his house of two stories, if only of four rooms. In this he should have *multum in parvo* of accommodation, but especially his bath-room and water-closet—the bath-room always, in any case from the time he can occupy the two-room dwelling of the large City block. But elsewhere, in the smaller blocks, the bath-room and the water-closet must always go together. Nothing will so enhance a man or woman's self-respect as this quiet, unobtrusive arrangement. The community of these essential necessities of civilised humanity is only tolerated in large establishments holding large bodies of people.

To sum up and emphasise my proposition on this head, I contend that it should be a grand architectural canon henceforth, that staircases, as a rule, should, in the houses in question, be at the further end of halls or lobbies leading directly from the front-door, and that they should project at least 7 ft. or 8 ft. from the main wall, and should be to all intents and purposes, insulated by an intervening passage continuous with the stair-landing. At each side of this small passage should be a window, to ensure a through draught at command. This arrangement can be carried out without very much expense of time or material, or loss of ground, even in buildings of the humblest pretensions.

Before I conclude my strictures, it behoves me to describe a variety of innovations, introduced with the double view at once of economising space and saving the working man expense in cupboards, store-presses, or closets, wardrobes and drawers. I refer to the simple utilisation of the corners of apartments for the most part. Without much infringement on the actual usable space of a room, we may carve out three or four snug closets, two of them always with a window each to the daylight. Here we have virtual or real larders, sculleries, pantries, bath-rooms, wardrobes, store-presses, and closets galore, available in the humblest dwellings, of one or two "pieces," for the poorest working man—all indispensable conveniences of a household, now found only in tenements for a higher class, and here put up at a very little expense, and therefore at only a small increase of rent. Even in houses of quality and pretence, for the same class of men when become rich masters, I have used freely these resources, especially in the arrangements of the kitchen.

All kitchens, I contend, no matter how spacious,

in closely packed town-houses, should have their corners so utilised. In one of these with a window should be the scullery with its sink and hot-water tap from the close adjoining kitchen range. On the other side of the central window lighting the kitchen, should be the corresponding closet with its window, a convenient site for a supplementary kitchen, larder, or pantry, or both in one. In those cases the space in front of the kitchen window would give room for an ample table with drawers on one side, and a coal-bunker on the other. All my plans are replete with these expedients for profitably using up vacant or superfluous space, where the necessities of the tenant require a series of conveniences to be placed at hand or within the smallest available limits.

The next great topic for discussion is the very pregnant one of ventilation. A safe and valid mode of introducing fresh air into our houses is the question of questions in domestic economy. Here an entire revolution is called for, and is at hand. The theory is all cut and dry, finished and perfect, to the satisfaction of an inquirer. All that remains now is to put the well-matured plans into practice. Advanced as the present highly civilised era is in the arts of construction, and with the means of wealthy and polished communities at command, we are still far behind in the appliances for perfect ventilation. It is an easy thing in theory and in fact to ventilate a house by letting in floods of fresh air from an open window or wall-openings, Sherringham or otherwise. And, in fine weather, there cannot be too much of this,—provided one keeps out of draughts. But when cold weather comes cold air is eschewed as fraught with danger. And the prejudice is partly justified, because of the clumsiness of the fresh-air expedients. Even our hardy soldiers, in cold nights, in model barracks (as I happen to know), prefer to stifle themselves,—to close up all means of access of pure air, because it is cold, and they think riskful. Now the point to gain, and it is an easy point, is the construction of house (whether on a large or small scale) on such a simple, inexpensive, universally applicable principle, that pure heated air in cold climates, and pure cooled air in hot climates, will be circulated throughout all parts of human habitations and places of assembly, by one identical machinery yielding at command a hot or cold fountain of supply, and this of all intermediate degrees of temperature, just as the necessities of the season dictate. This machinery, I say, in building a house, is inexpensive to construct, is liable to no derangements, and requires little supervision. My plans, models, dissected models, and diagrams show all this. By these improved methods there will be no excuse henceforth either for bad ventilation or the alternate evil of cold draughts in our houses; nor will the atmosphere of a picture gallery, like the Grosvenor, as occurred one day there last summer, resemble that of the hot room of a Turkish bath. To avoid breathing tainted air, people need not, after this, be exposed to the chances of chills and colds, of coughs and quinsies, of rheumatism and inflammation. I greatly mistake if an immense number of our finest buildings, our palaces, law courts, club-houses, colleges, picture-galleries, museums, theatres, concert-rooms, hotels, hospitals, churches, &c., will not demand to be fitted, at any expense, with the mechanism to these ends. But with new buildings, projected or started, and with our embryo ironclads on the stocks, the incorporation with the architect's designs of a valid ventilating, heating, and cooling apparatus, pervading every department, chamber, and floor, will cost comparatively little time, trouble, or material to carry the new system into effect.

This question, then, of ventilating, heating, and cooling human habitations, I shall now discuss under one head,—for they are but parts of one perfect system,—the action of one identical mechanism, modified to meet the demands of varying seasons and circumstances. Nor, in all this, do I make any pretensions to novelty or discovery. I simply turn to account a great principle of circulation every day adopted in coal-mines, and which, moreover, has been well tested and attested for forty years in the Pentonville Prison. The really wonderful thing is, that a simple, safe, sure, and inexpensive scientific expedient has not been largely supplied by architects to the great public buildings above enumerated. If this hot or cold current never escaped from its flues, but merely circulated through hollow walls and hollow floors, from its entrance in the basement to its exit 30 ft. or 40 ft. above the roof, the atmosphere of the whole house, in every chamber, hall, lobby, and staircase, would be uniformly warm and genial in the coldest weather, and as uniformly cool and bracing in the heat of summer or the tropics.

Of this comprehensive circulatory agency, a grand central, all-commanding chimney, with a never extinguished fire near its summit, is the motive power—the medium of exhaustion or elimination of all the vitiated and residual air in every chamber, hall, passage, and staircase of the largest possible building. The walls are proposed to be hollow—to have a continuous interspace throughout of from 4 in. to 1 ft. at an average, along which vacancy in the walls, and the same in the floors, a continuous stream of air, cooled or heated, or *au naturel*, is conducted from a chamber of supply in the basement, till it finds its exit by the great chimney,—just as a river disembogues itself into the vast ocean,—there losing all the foulness and all the *débris* it had swept down in its current. No one who understands mechanics will here presume to say that a hollow wall, or floor, or pillar, or girder may not be as valid support for the weight it has to bear as if made solid. This sort of thing applied to steamships will be much simpler work than in house construction, because there there is so much hollow wall, and hollow floor, and hollow mast, hollow funnel, and hollow foundation (the kelson), that the whole art necessary is the fitting of holes here and there, to make the communications continuous, and this without infringing the integrity of its separate compartments. For the rest, there is the non-utilised draught up the funnel,—the *primum mobile*, henceforth, of a perfect system of ventilation, and of the circulation of cold or warm air in all steam-going ships, fighting or commercial.

As regards this power to pervade large or small blocks, or isolated houses, with pure air, cold or warm, I may remark that the central chimney force is imperative for the large blocks; but that in single self-contained houses on the "perpendicular" principle, the ordinary chimney-breast, with its flues improved and added to, will be perfectly competent to this grand domestic acquisition,—the service of cold or warm air *ad libitum* throughout a household. This is no small recommendation of the system, as applied on a small scale, to rows of houses, or self-contained villas and mansions of all sizes. In the case of the poor, we hope the day is at hand that ventilation will be made compulsory, as education is for the same class.

Anyhow, I have a firm conviction,—and I want this recorded in all architectural books as coming from a physician,—that the want of this grand desideratum of social life,—a perfect system of ventilating, heating, and cooling houses,—has produced more prostration, mental and moral, more suffering, more disease, and more deaths than all other causes of human deterioration and extermination put together.

WROUGHT-IRON GATES, PARIS EXHIBITION.

IN the notice of English Houses at the Paris Exhibition given in our last (p. 461, *ante*), it was stated, after describing a house erected by Messrs. William Cubitt & Co., of Gray's-inn-road, that some wrought-iron gates which have been prepared for the Right Hon. Lord Crewe are used to enclose the garden between this house and the end one. Of these gates we now give a view. They are of wrought and hammered iron, and are intended for one of the approaches at Crewe Hall, Cheshire. They were designed by Mr. Edward M. Barry, R.A., and manufactured by Messrs. Cubitt & Co.

HEALTHY HOUSES.

SIR,—In common with doubtless many of your readers, I have followed with interest the discussion on open pipes, traps, ventilation, &c., to which you have opened your columns. There is another subject of equal importance to "healthy houses,"—the proper mode of drying their basements, where the subsoil is clay or heavy land, and the basement is overlaid with flags or tiles periodically wet with washing, &c., considering that drains through or under houses are now condemned. Will some of your contributors, who are so competent to deal with the subject, take it up?

Q.

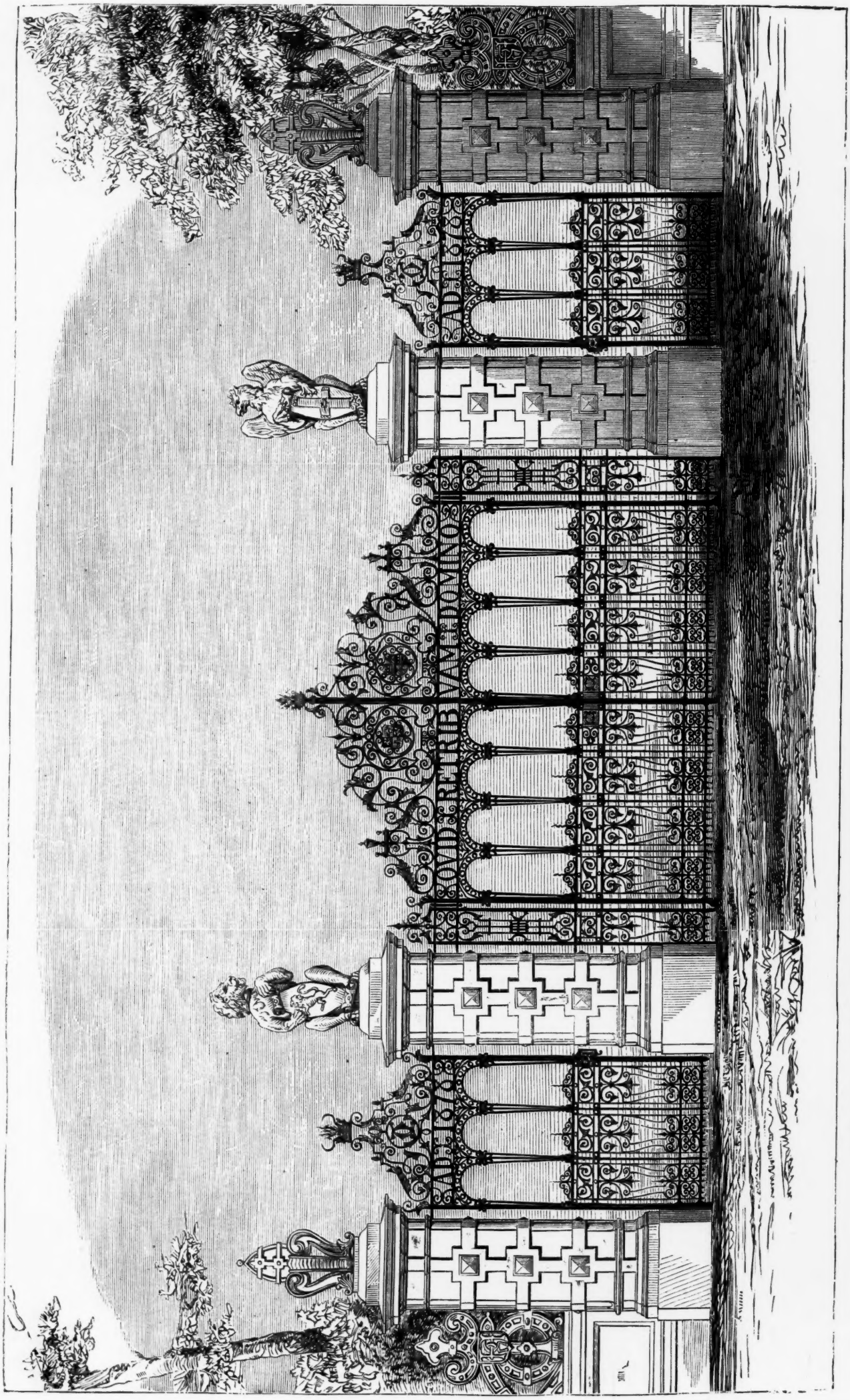
OXFORD UNIVERSITY OBSERVATORY.

IN May, 1873, the Oxford University authorities, having determined to make the study of astronomy one of the advantages, and indeed, necessities, of university education for those who might intend in after-life to devote their time to that fascinating branch of research, agreed to purchase as perfect a refracting telescope as present science could produce, and to erect a building to contain it. Convocation resolved to request Mr. Charles Barry to furnish the design and plans for such a building, which might be capable of extension if need arose. Accordingly, in June following, Mr. Barry made a design which, from the limited means placed at that time at his disposal, about 2,000*l.*, could only consist of a square building to carry the requisite revolving dome for the telescope, and in its lower stories a computing-room and workshop. This was hardly commenced, when in November, 1873, Mr. De la Rue, whose name must always be associated with astronomical, and particularly lunar, research, made the generous offer to present to the new University Observatory his very valuable reflecting telescope, and several other valuable astronomical instruments (described below), conditionally that the building should be so far enlarged as to contain them efficiently in regard to their use by the professor and by students. The University at once responded to this wish, and the further portion of the design was undertaken, comprising the dome to contain the De la Rue telescope, and the annexe connecting it with the original central dome, which annexe should contain the other instruments. These two portions of the design were completed fit for use in March 1875, the contractors being Messrs. Symm, of Oxford, and the total cost 3,280*l.* The mechanical arrangements necessary for the revolving domes and the shifting roofs, for the transit and other instrument in the annexe, were skilfully designed by and carried out under the supervision of the late Mr. Price Prichard Baly, C.E.

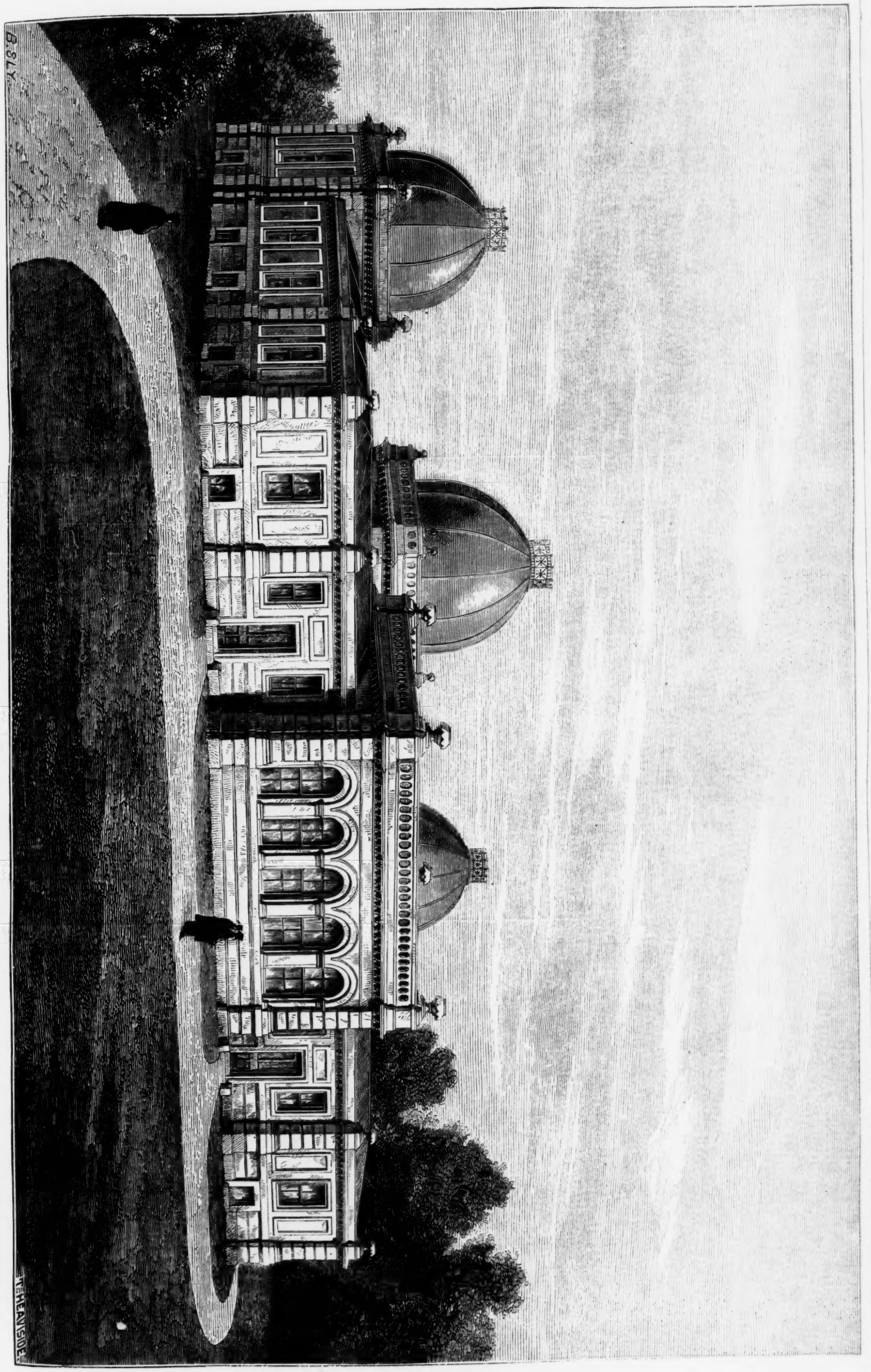
Very soon after the building was finished, the zealous efforts and practical lectures of the Savilian Professor of Astronomy in Oxford, the Rev. Charles Pritchard, in whose charge the new observatory was placed, caused the formation of a very numerous class of students, and in 1876 the Professor reported to the Committee of Visitors that it became almost an essential to provide a fitting lecture-room and a reference library, and intimated that if these could not be provided in connexion with the observatory, the lectures must be given in some other building, though, of course, at great inconvenience. Nothing was, however, done that year; but upon a report from the Professor in June, 1877, further urging the growing needs of the observatory, the visitors obtained permission from Convocation to expend a further 2,000*l.* in providing a good lecture-room, library, and other conveniences, and for warming the centre building with a system of hot-water pipes, with a further 400*l.* for laying out grounds, fencing in, and incidental expenses. Mr. Barry then, at the request of the visitors, proposed to continue his design by the erection of those rooms communicating with the original centre block, and a tender for the same by Messrs. Symm was accepted, and the work at once commenced, and has now been brought to completion, so that lectures in the new room will at once be commenced.

It will be seen on reference to the plan and view how far the portion of the building erected realises Mr. Barry's complete design. The parts tinted solid are those erected. There is as yet no person resident in the building as caretaker,—an obvious necessity when the great value of its contents is remembered; this residence is proposed to be contained in some buildings around small open courts on the east side, kept low so as not to interfere with observations from the domes or flat roof over the lecture-room. Finally, to complete the building there would be a third telescope dome, an additional annexe connecting it with the central dome to contain additional instruments, and around a similar small courtyard some further rooms for students engaged in special studies, and for the gradual but essential extension of the library. It is to be hoped these will be added by the authorities at no distant date, when, in the words of the Professor's report of 1876, "The University observatory would become admirably efficient, both as a place for instruction and as an institution for original research."

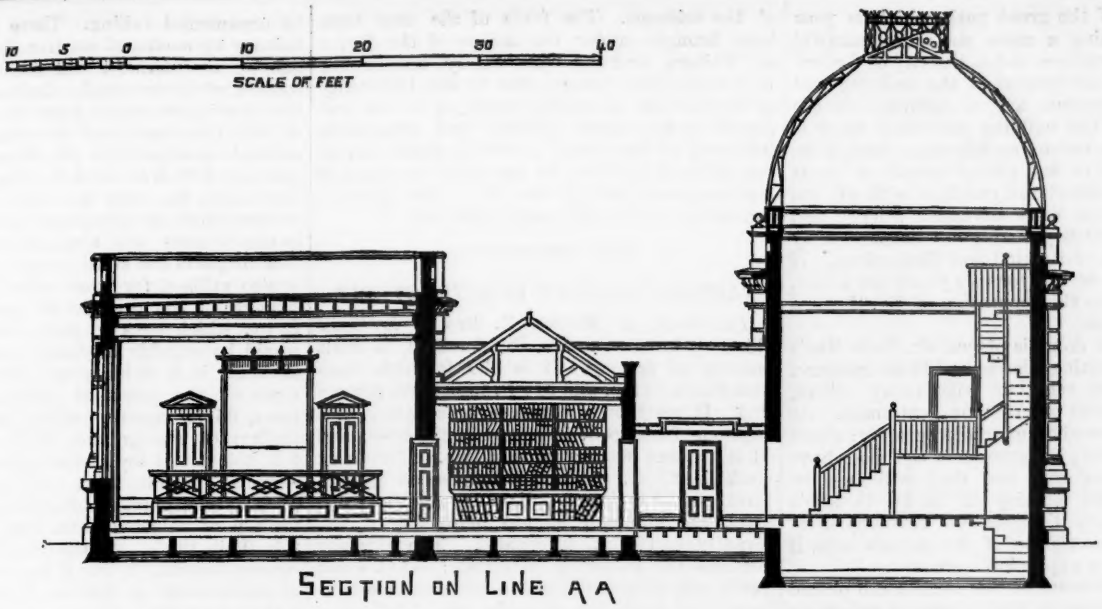
It should be mentioned that the new building is placed on a most admirable and beautiful site

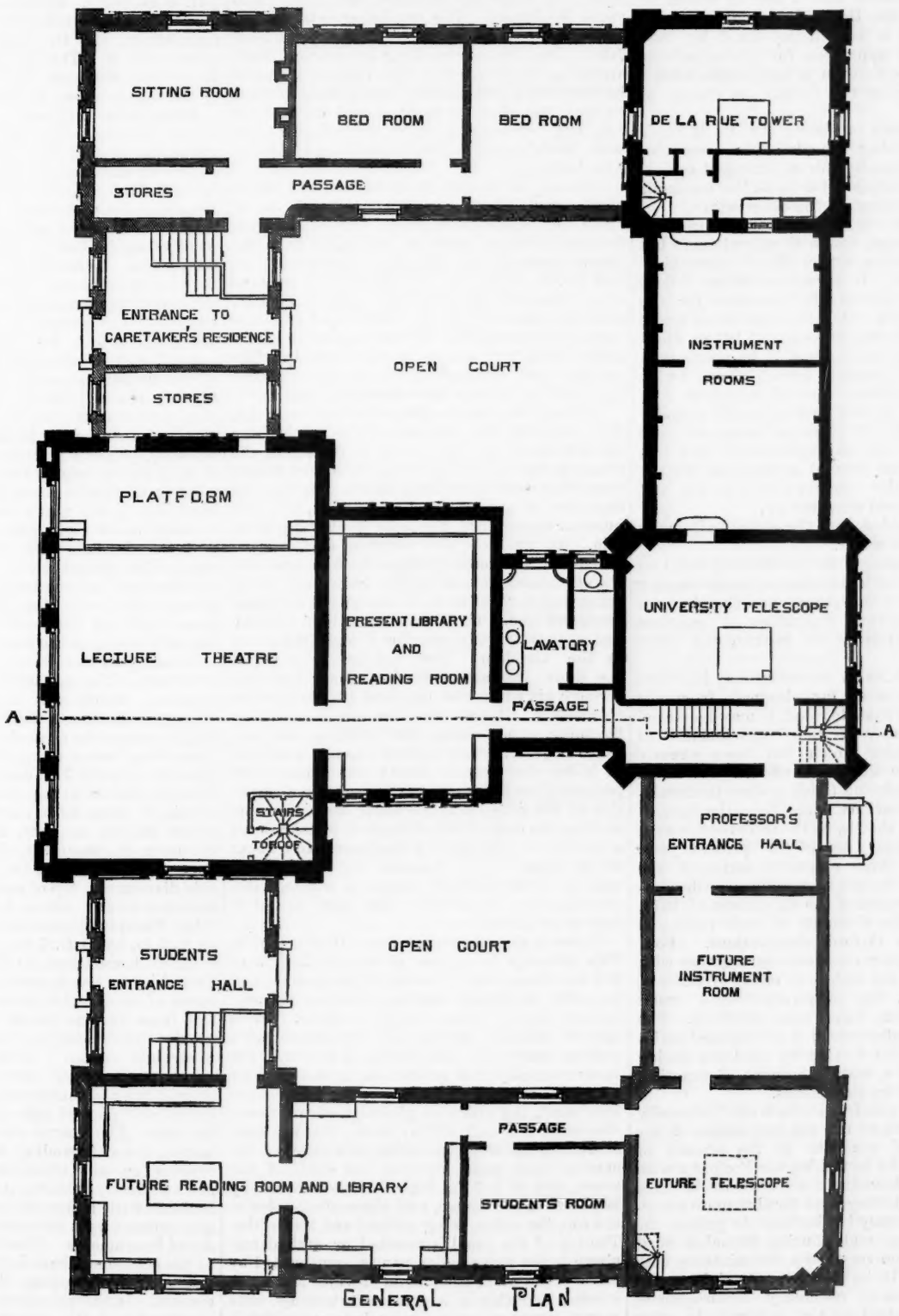


WROUGHT IRON GATES, AT THE PARIS EXHIBITION.—Designed by Mr. Edward M. Barry, R.A., Architect.



OXFORD UNIVERSITY OBSERVATORY.—MR. CHARLES BARRY, F.S.A., ARCHITECT.





OXFORD OBSERVATORY.—*Plan and Section.*

in the middle of the great park, which is year by year becoming a more and more beautiful feature of the western end of the city of Oxford.

The mode of occupation of the building and its valuable contents are as follows:—In the larger dome of the building described there is erected a large refracting telescope, having an aperture of 12¼ in. and a focal length of about 15 ft. It is mounted and provided with all the accessories of the most advanced science and modern skill, and is probably not surpassed by any instrument of its kind and dimensions. It has now been in use for two years and a half, and well sustains the reputation of Mr. Howard Grubb, of Dublin.

In the smaller dome is placed Mr. De la Rue's well-known reflecting telescope of 13 in. aperture. This instrument, together with many others, was the munificent gift of that gentleman. At present it is devoted to lunar photography; about 1,200 measurable photographs of the moon have already been secured, and they will soon be subjected to the scrutiny of Mr. De la Rue's large micrometrical engine for the purpose of measuring the mutation of the moon's axis, if such exists to an appreciable amount.

In the two divisions of the corridor are placed a transit instrument, and a second reflecting telescope from Mr. De la Rue mounted as an altazimuth. It is now being fitted by that gentleman with apparatus for photographing the sun's photosphere on a large scale, with a view of ascertaining the details and change of details thereon.

In the basement is placed Mr. De la Rue's engine for polishing specula: the remainder serves for photography, for a darkened optical room, and for a workshop for the skilled mechanic who acts as attendant on the observatory.

The flat top of the lecture-room is provided with a deep parapet, and with several small but very firm platforms, not in direct communication with the roof. It serves as an out-of-door observatory, or open-air lecture-room for the university students. On these platforms are to be placed a reflecting telescope of 10¼ in. aperture, a refracting telescope of 4¼ in. aperture, a sextant, a small portable transit circle, and a transparent star-drum movable round an axis parallel to that of the earth: on this cylinder are projected all the principal stars and the celestial circles. An arrangement of this sort promises to secure several advantages for the instruction of the students, which are not afforded by a closed observatory.

It should be added that the entire building is warmed with hot water.

There are gratings in the floor of the two domes through which in continued damp weather warm air can be introduced, and thereby prevent the mischievous deposition of moisture which is so injurious to instruments when unprotected.

If it be asked, as it naturally may be, what results have been so far obtained, from the costly apparatus thus detailed, it may be stated that, independently of the large amount of lunar photography which has been already referred to, the delegates of the Clarendon Press are now printing (with a view to circulation) the observations made from the autumn of 1875, so soon, that is, as the instruments were erected, to January 1st of the present year. They comprise three extensive series of the co-ordinates of Saturn's satellites. Observations of the fine orbs of the six comets of 1877, together with the elements of their orbits, as computed from Oxford observations. Four hundred double star observations, together with the elements of the elliptical orbits of three of them. Finally, the newly-discovered small satellites of Mars have been observed. The above work is independent of a continued series of lectures to the University students during term time, and a certain amount of practical work completed by themselves.

Such are the provisions which the University of Oxford has made for the instruction of her higher order of students in the science of astronomy, and for furnishing the Professor with the means of advancing the science itself. Nor are arrangements forgotten for that more numerous class, who may be inclined to pursue the more interesting and alluring branches of it which require no very deep acquaintance with mathematics. It is, however, only right to add that the amount of pecuniary encouragement held out in Oxford to the students in other branches of learning is considerable, while but little has yet been done for the most ancient, the most practically useful, the most elevating of the sciences. The facts of the case have been brought under the notice of the Board of Visitors, and the Observatory, and of the University Commission; and as the University of Oxford has invariably acted in a fair and liberal spirit when properly and accurately informed of the issues before it, there can be but little doubt that in due time the want of encouragement which has been the fate of astronomy will be effectually removed.

FACTORY CHIMNEY CONSTRUCTION.*

THE shaft of Messrs. E. Brooks & Sons' chimney, fireclay works, Huddersfield, is built entirely of fireclay. It is 330 ft. high from foundation to top, and 315 ft. high from ground line. It rests on a concrete foundation, with ragstone footings 36 ft. square at the base, and 31 ft. square at the ground-line. The brick shaft is 27 ft. external diameter at ground level, and 15 ft. internal diameter at the same level, the diameter at top being 12 ft. externally and 9 ft. internally. The chimney contains the following materials:—144 cubic yards concrete, 2,452 cubic feet ragstone footings, 3,341 cubic feet of ashlar, and 2,227 cubic yards brickwork. The cap being so large, and overhanging so much, has cost the firm at least 700*l*. The firm, from their experience, have arrived at the conviction that chimneys should be built with one regular batter from bottom to top, and that no stone should be used at top, any overlapping to be gradually formed with hard-burnt radiated firebricks, 14 in. by 5 in. by 3 in.

Chimney at Messrs. Mitchell, Brothers', Manchester-road, Bradford.—This chimney is of stone, and octagonal on plan. The height, from foundation to top, is 330 ft., the height from the ground being 300 ft. The flue is perpendicular, and 7 ft. in diameter. The foundation consists of one course of concrete, 22 ft. by 22 ft. by 1 ft., and one course 21 ft. by 21 ft. by 1 ft. The stack itself measures 20 ft. across at the foundation, and 9 ft. across at the summit. The chimney was designed by Mr. Mark Brayshaw, and built by Messrs. John Moulson & Son.

Chimney at Adams's Soap Works, Smethwick. This is a circular chimney. The height from the bottom of the foundation to the top of the chimney was originally 326 ft. 10 in., the height from the ground-level being 312 ft. The external diameter at the ground-line is 27 ft. 2 in., the internal diameter at the same level being 15 ft. 2 in. At the top the external and internal diameters are respectively 5 ft. 6 in. and 4 ft. Two thousand tons of bricks were used in its construction, together with 150 tons of concrete, sand, and lime. The chimney was built in 1835, and at the time of its erection it was the highest in the kingdom. The builder who began the stack felt alarmed when about half-way through his work, and the firm had to finish it themselves. It has been five times struck by lightning,—once during the building, and four times since. No very serious damage was done to it by the electric fluid; but once, when perhaps from the same cause, and the abstraction of the lime by hydrochloric acid from the mortar, the owner was compelled to take down a portion of the top. A few years ago, about 30 ft. more were removed by Mr. Frith, builder, of Coventry, by means of a kite, without stopping the works. The total height is now about 250 ft.

Chimney at Camperdown Linen Works, Lochee. This chimney is square up to the height of 230 ft., where there is a balcony or cornice, and from this to the top the form is octagonal, and finished with a heavy moulded coping. It is built in different panels, and ornamented with various designs in parti-coloured bricks. The base externally is of ashlar, and surmounted by a massive moulding in stone. Above this is the first panel, the stiles or pilasters of which are chequered red and white; above this is a base moulding, out of which spring the stiles of the next or main panel, forming the shaft of the tower, and is 137 ft. high. It is relieved by loopholes in the centre, and sham clock-holes at the top, the stiles being striped red and white. The top of the panel is rounded or arched, and above it are two smaller panels, surmounted by a frieze and other ornaments in white and black bricks; over this is a cornice or balcony, with square turret at each corner, between which is an ornamental railing. There is access to the balcony by means of an iron ladder, built into one of the corners, the outside walls being square, while the smoke-shaft, or flue, is round, thus leaving an empty space in each corner, one of which has been used for this purpose. The smoke is admitted into the chimney by elliptical openings 9 ft. 6 in. by 5 ft. 6 in. in each of the four sides, but only two are yet in use. At present there are fifty-eight furnaces connected to the chimney, and also the smoke from thirteen forges in the smith's shop, and the draught is also utilised for some other purposes. The strength of the draught at present is equal to 1¾ in., which goes to prove that the chimney would be capable of doing double the amount of work it is doing now. The following are some of the principal dimensions:—Foundations, 35 ft. square,—walls, 12 ft. thick. At surface of the ground, 30 ft. square,—walls, 6 ft. thick. At top of first panel, 24 ft. square,—walls, 3 ft. 5 in. thick. At top of main panel, 21 ft. 3 in. square,—walls, 2 ft. 5 in. thick. At the top of balcony, 20 ft. 3 in. square,—walls, 2 ft. 0½ in. thick. At the top of chimney, 19 ft. square,—walls, 1 ft. 6 in. thick. Diameter of smoke-shaft at bottom, 14 ft. 6 in.,—walls, 1 ft. 6 in. thick. Diameter of smoke-shaft at top, 13 ft. 8 in.,—walls, 9 in. thick. Height from foundations, 296 ft. Height from surface of ground, 282 ft. The chimney was designed by Mr. James Maclaren, for Messrs. Cox Brothers, of the Camperdown Linen Works.

Wrought-iron Chimney, Messrs. Schneider's Works, Creusot.—This chimney has a height above the ground level of 279 ft., with a diameter at the top of 7 ft. 6¼ in., and at the base of 22 ft. 11½ in. The weight is 80 tons. Its dimensions obviously precluded its being raised in a single piece without the employment of appliances which were considered inadmissible. Under these circumstances it was decided to erect the chimney in parts, without the use of any fixed scaffolding whatever. The chimney is founded on a mass of masonry rising about 3 ft. 3 in. above the level of the ground, and weighing about 300 tons, the base of the structure,—which is spread,—being fixed to this masonry by a very strong angle-iron ring riveted to the chimney-plates, and secured to the foundation by holding-down bolts. The chimney, properly so-called, is composed of rings 4 ft. 1 in. in height, the plates varying from 0·552 in. thick at the base to 0·275 in. thick at the summit. At the ninth ring the circumference is made up of eight plates, while at the upper part the rings are each composed of four plates only. To protect the plates from the heat arising from the combustion of the gas, and to prevent the lower rings from being injured, an inner shaft of fire-brick is carried up within the iron casing to the height of eight rings.

Chimney at the West Cumberland Hæmatite Ironworks.—The principal dimensions of this chimney, which was designed by the late Professor Macquorn Rankine, are as follow:—Height above the ground-line, 250 ft.; depth of foundation below the ground-line (including a layer of concrete 3 ft. deep), 17 ft.; total height from foundation to top, 267 ft. Inside diameter at top of cone, 13 ft.; inside diameter at 2 ft. above bottom of cone, 21 ft. 10 in. Inside diameter in basement, 18 ft. 10 in.; inside diameter of archways for flues, 7 ft. 6 in. Outside diameter at top of cone, 15 ft. 3 in.; outside diameter at 2 ft. above bottom of cone, 25 ft. 7 in. Outside dimensions of foundation course, 31 ft. 6 in. by 31 ft. 6 in.; outside dimensions of concrete foundations, 34 ft. 6 in. by 34 ft. 6 in. This chimney has to carry off the gaseous products of combustion from four blast-furnaces, and from various stoves and boilers. Above ground the chimney is a frustum of a cone, with a straight batter. Underground there is a plinth or basement octagonal outside at the ground-line and square at the bottom; cylindrical inside and pierced with four circular openings for flues. The reason for adopting a straight batter, notwithstanding that a curved batter enables certain theoretical conditions to be more perfectly fulfilled, is that the accuracy of building with a straight batter can be tested at any moment by a glance of the eye, without the aid of instruments. The change from the square to the octagonal shape in the basement is made gradually by stepping the brickwork at the corners. It had previously been ascertained by observation of the success and failure of actual chimneys, and especially of those which respectively stood and fell during the violent storms of 1856, that in order that a round

* From a paper by Mr. R. M. Bancroft, C.E., recently read before the Civil and Mechanical Engineers' Society. Concluded from p. 463, *ante*.

chimney in this country may be sufficiently stable, its weight should be such that a pressure of wind of about 55 lb. per square foot of a plane surface directly facing the wind, or 27½ lb. per square foot of the plane projection of a cylindrical surface,—that is to say, a pressure equivalent to the weight of a layer of brickwork 3 in. deep, and of an area equal to the vertical section of a round chimney,—shall not cause the resultant pressure at any bed joint to deviate from the axis of the chimney by more than one quarter of the outside diameter at that joint.* By calculating according to that principle, the thickness of brickwork in the cone was determined to be as follows:—Uppermost 80 ft. of height, 1½ brick; next 80 ft. of height, 2 bricks; next 88 ft. of height, 2 bricks; lowest 2 ft. of height, increasing by steps from 2½ bricks to 4 bricks, in order to spread the pressure on the basement. The bed joint of least stability is 2 ft. above the ground-line, and the deviation of the resultant pressure from the axis of the chimney at that joint, which would be produced by such a wind as has been mentioned, is 6 ft. 4 in., being a fraction of an inch less than one quarter of the outside diameter. The thickness of the arching in the openings for flues is three bricks. The following are the intensities of the mean pressures due to the load on different bed-joints:—At 2 ft. above the ground-line 8 tons on the square foot; in the basement at the springing of the arches, 3 tons on the square foot; on the upper surface of the concrete, 2 tons on the square foot; on the ground below, 1·6 tons on the square foot. The thicknesses of brickwork already stated include the firebrick linings, whose thicknesses are as follow:—In the uppermost 160 ft. of the cone, ½ brick; in the lower part of the cone, the basement, and the flue archways, 1 brick. The firebrick lining is bonded with the common brickwork in the ordinary way, the only difference being that the firebricks are laid in fireclay and the common bricks in mortar. The reasons for adopting this mode of construction in preference to an internal firebrick chimney are as follow:—First, when the firebricks are bonded with the common bricks they contribute along with the common bricks to the stability of the chimney, whereas, if an internal firebrick chimney had been used, an additional thickness of common brickwork would have been required in order to give stability to the outer cone; secondly, unless the internal chimney is carried up to the top of the outer cone, there is a risk of damage through the explosion of inflammable gaseous mixtures in the space between; and thirdly, under the same circumstances, there is also a risk of the cracking of the outer cone, at and near the upper end of the inner cone, through unequal heating at that place. Vertical cracks in a chimney are the more dangerous the higher the level at which they occur, because the safety of the higher part of a chimney depends more on cohesion and less on weight than that of the lower parts. When such cracks take place near the ground, they are of little or no consequence. The basement is paved inside with 6 in. of firebrick resting on 6 in. of common brick, which rests on the concrete. The ordinary brickwork is of white bricks of very good quality, supplied by the Iron Company. It is built in English bond. In the basement there is one course of headers to every two courses of stretchers; in the cone one course of headers to every three courses of stretchers. Strips of No. 15 hoop-iron, tarred and sanded, are laid in the bed-joints of the cone, at intervals of 4 ft. in height, with their ends turned down into the side-joints. Care was taken to bed the hoop-iron on the common brickwork, and not on the firebrick lining. The length of hoop-iron in each bed-joint in which it is laid was twice the circumference of the chimney. In the concrete foundation, the basement, and a small part of the cone, the mortar was made of hydraulic lime. Owing to an unexpected difficulty in obtaining such lime on the spot, it had to be brought from a distance at considerable expense, and, therefore, the mortar for the rest of the structure was made of a very pure lime from the immediate neighbourhood, rendered artificially hydraulic by a mixture of iron scale from the rolling-mills at the works, it having been in the first place ascertained that the supply of iron scale could be furnished to the contractor with sufficient rapidity. The following are approximately the proportions of the ingredients of the mortar by measure:—Lime, 2 measures; scale, 1 measure; sand, 5 measures,—total, 8 measures. It is scarcely necessary to state that the use of iron scale for hardening mortar and making it artificially hydraulic is familiar to engineers, architects, and builders in Glasgow and its neighbourhood; but in many other parts of the country that process appears to be less known than it deserves. The principal constituents of the iron scale are probably silica and protoxide of iron; but its action upon lime, and the nature of the artificial cement which it forms, have not hitherto, so far as I know, been investigated by chemists. Considering the benefits that have arisen from the chemical analysis of other cementing materials, it is much to be wished that some chemist would undertake the examination of this material also. On the top of the chimney is a pitch-coated cast-iron curb, 1 in. thick, coming down 3 in. on the outside and inside. The lightning-conductor is a copper-wire rope about ¾ in. diameter. It terminates in a covered drain in which there is always a sufficient run of water. In the construction of the internal scaffolding, care was taken that the needles or horizontal beams should be supported wholly by the brickwork, and not by the upright posts, for great danger has been known to arise from the brickwork coming to bear upon the ends of the needles, and, through them, on to the posts, owing to the settlement of the lower part of the chimney. In order that the concrete foundation might have time to harden before being subjected to a heavy load, it was made by the Iron Company themselves before the contract for the chimney was let; for it was known that intense pressure tends to retard the hardening of concrete. The progress of the building was restricted by the specification to a rate not exceeding 6 ft. of vertical height per day. Tenders were taken from a limited number of builders in the North of England and in Scotland, and the lowest offer was accepted, being that of Messrs. William Wilson & Son, of Glasgow. The work was executed by that firm in a manner that left nothing to be desired. The following were the amounts of the estimated and actual cost respectively:—Engineers' approximate estimate, 1,672*l.*; actual cost, including designing and superintendence, 1,560*l.*; being at the rate of almost exactly 4d. per cubic foot of the whole space occupied by the building, which is 94,000 cubic feet nearly. According to the last account, the temperature inside the chimney, when doing about three-fourths of its full duty, is 490 deg. Fah., and the pressure of the draught is 1¼ in. of water, which agrees to a very small fraction with the pressure as deduced theoretically from the temperature and the height of the chimney. The dimensions and stability of this chimney are nearly the same as those of the second highest chimney at St. Rollox Chemical Works, built about ten years previously, except that in the older chimney the joint of least stability is 100 ft. above the ground. In the great St. Rollox chimney, 455 ft. 6 in. high from foundation to top, the greatest pressure of wind which can safely be borne is almost exactly the same, viz., 55 lb. per square foot of a plane surface, or about 27½ lb. per square foot of the plane projection of a cylindrical surface. The bed-joint of least stability is 210 ft. above ground. In the great Port Dundas chimney, 468 ft. high from foundation to top, the bed-joint of least stability is 200 ft. above the ground, and the greatest safe pressure of wind is 67 lb. per square foot of plane surface, or 33½ lb. per square foot of the plane projection of a cylindrical surface; so that here it may be considered that there is an excess of stability.

Messrs. Gostling's (Cement-works) Chimney, Northfleet.—This chimney has a height, from the foundation to the top, of 227 ft. (220 ft. from the ground-level). The outside diameter is, at the base, 30 ft., and at the ground-line 22 ft. The inside diameter is, at the ground-line, 14 ft. 6 in.; and the outside diameter at the top is 11 ft. The inside diameter at the top is 9 ft. 6 in., reduced, at 4 ft. 7½ in. from the top to 8 ft. 9 in. The rate of progress in building was under 15 ft. per week, or 2 ft. 6 in. per working-day. The bricks chiefly used were Rutter's "paviors," or best picked stocks. The mortar was made of the best Dorking grey-stone lime and the best Thames sand, and every few courses of work were grouted in with Portland cement. Part of this shaft fell in October, 1873, and was rebuilt and finished by August, 1874. Special precaution was taken, in rebuilding, that all the bricks should be wetted before being laid. The architect was Mr. James Cubitt, the builder being Mr. Blagburn.

Chimneys at the Georgs-Marien Ironworks, near Osnabruck.—The first chimney, erected in 1857, has a height of 180 ft., with a clear width at the bottom of 10 ft. 9 in., and at the top of 7 ft. The height of the square basement, built in sandstone, is 30 ft. The shaft is octagonal, and of brick, the walls being made of six different thicknesses, consisting of a brick and a half at the top, and of four bricks at the bottom (the length of the bricks used at Georgs-Marienhutte is 10 in.). Two other chimneys, 102 ft. high, have also a square basement of sandstone and an octagonal shaft of bricks, with a clear width of 4 ft. at the top, and of 6 ft. 3 in. at the bottom. The walls of these shafts are each 1 ft. 8 in. thick at the top, and 2 ft. 6 in. thick at the bottom. A fourth chimney, erected in 1868, has a height of 102 ft., a clear width of 7 ft. at the top, and 9 ft. at the bottom. The shaft is built in four thicknesses, of a brick, a brick and a half, two bricks, and two bricks and a half; whilst the base, 18 ft. in height, and made of sandstone, is 3 ft. 6 in. thick. The shaft of this chimney is built from the base to the top in such a manner that it forms in the circumference four separate parts, which are simply brought in contact with each other, without being jointed by mortar. This construction has been found to answer exceedingly well, and is recommended for chimneys exposed to various temperatures; as, for example, in the case of chimneys connected with coke-ovens, the gases of which are either applied to the firing of boilers or are allowed to escape directly into the chimney in the event of the boilers being laid off for cleaning or repairs. The latter arrangements have, however, been altered so far that, with the hot gases, cold air is simultaneously admitted into the chimney. The most recently-erected chimney, built in 1870, is sufficient for twenty of the Cornish boilers, and has a height of 120 ft., and a circular shaft of a clear diameter of 10 ft. at the top, and 10 ft. 10 in. at the bottom. This chimney has no base, and the thickness of the walls decreases in seven steps, from four bricks to one brick (10 in. each). The circular form has been chosen, in order to save the expensive base and the many-shaped bricks necessary for octagonal chimneys. All the chimneys have been erected without scaffolding, and by conveying the materials through the inner space of the chimney.

The Chimney at the Grosvenor-road Pumping Station of the western district of the metropolitan main drainage works is constructed of gault bricks, with Portland stone dressings. It is 200 ft. high, and has a campanile-like appearance. It is a model shaft in its style. The foundations of the shaft rest upon a mass of concrete 35 ft. square, carried down to the clay. The shaft is constructed double. The circular central shaft, 7 ft. in diameter, serves for the smoke, while the outer square casing encloses a staircase consisting of 220 stone steps, reaching to the top, which is terminated by a heavy iron capping and stone cornice. This square tower measures 21 ft. at the base, and 15 ft. at the summit. Sir J. Bazalgette, C.B., was the engineer-in-chief, Mr. Lovick being the resident engineer. The bricks were purpose-made, and gradually tapered from 1 ft. 6 in. to 1 ft. 2 in. The lightning conductor is of copper tube.

Messrs. Abraham Stott & Sons' Cavity Chimney, Oldham.—The height of this chimney from foundation to top is 180 ft., the height from ground-level being 168 ft. The external diameter is 16 ft. at base and 7 ft. 6 in. at top, the internal diameter at base being 6 ft. The height of the cavity was 30 ft. After completion, this chimney leaned over considerably on one side, and the owners entered into a contract with two brothers, who were chimney-builders, to "saw" the chimney; but instead of sawing, they took out a whole course of bricks, and, while one of the men was on a scaffold about a third of the distance from the ground engaged at the work, the stack fell over, except about 30 ft. from the base, and killed one of the men.

Concrete Chimney, South Docks, Sunderland.—In compliance with the requirements of the Board of Trade, the River Wear Commissioners have erected, from the designs of their engineer, Mr. H. H. Wake, large chain-cable and anchor-testing works at their South Docks at Sunderland. The whole of the buildings are constructed of concrete, built with Tall's patent apparatus, by Mr. George Grainger. The design included two boiler-house chimneys, one of which has

* See Proceedings of the Philosophical Society of Glasgow for 1856, p. 14.

just been completed, and as it is believed to be the first chimney of the kind built of concrete and without scaffolding in this country, some brief description of the manner of its erection may be of interest. The chimney is carried up square until it is well clear of the level of roof of testing-house, the dimensions being 22 ft. 3 in. by 7 ft. 6 in. by 7 ft. 6 in., the construction of this portion presenting no feature of novelty. At this level the corners are gradually taken off the square base, until, at the height of 24 ft. 9 in. above the surface of the ground, it is brought into the octagonal form of the tapering portion of the chimney, that the profile of base mould might be shown to greater advantage. This octagonal and tapering portion of chimney, in which the interest and difficulty of the work chiefly centred, was moulded in the following manner:—Panels 3 ft. in height were formed of ¾-in. boards, hinged together in pairs at their outer edges, being so proportioned that the lines of their inner edges, when produced, came into one point at the centre, at half the height of this section of the chimney, the intermediate space being made up by a wedge-piece, which, after the concrete poured between the panels on the inside and outside of the chimney-walls had set, was easily reduced to meet the decrease in size on the next left due to the batter, this reduction being just sufficient to take off the holes in one side of the wedge for the stud-bolts, which connected it to the upright members of the frame. When the stalk of the chimney had been carried up to the half of its full height, these panels were sufficiently reduced to admit a second set of intermediate wedges, of exactly the same dimensions as those introduced at the level of the base mould, bringing the inner edges of the reduced panels into one point at the centre of the top of the chimney, in a manner similar to that in which, at their original dimensions, they had been brought together at half of its height, affording a tolerably severe test of the accuracy of the work, which it was found to bear admirably, for the uprights being 6 ft. in length, and always being moved with the panels, which were only half that height, they had a continual hold of 3 ft. on the completed portion of the work, which sufficiently insured regularity in line. The chimney when completed was stuccoed with cement, and drawn in courses to imitate stone; it is considered to present an excellent example of concrete building, both as regards strength and appearance; the chimney being exactly perpendicular, and the mouldings, which were formed in their respective positions, clear and sharp in outline. The concrete for the work was specified to be mixed at the rate of one part of Portland cement to eight of gravel, but in the case of the chimney the proportion was increased to one in five by the contractor, by whom also the simple and efficacious arrangement used in building was devised.

Cavity Chimneys.—This form of chimney is frequently built in the North of England. The inner ring is carried up vertically of 4½ in. fire-brick for, say, 20 ft. to 30 ft. high, until it nearly closes with the main shaft. The outer or main shaft is started with 1 ft. 2 in. work at base, and diminishes or batters regularly towards the top.

Taking Down Chimneys.—There is an ingenious arrangement for facilitating the taking down an old chimney-shaft which was employed, some little time ago, at Messrs. Gilkes, Wilson, Pease, & Co.'s Tees Ironworks, Middlesbrough, and which was designed by the engineer of the works, Mr. Chas. Wood. In consequence of the chimney-shaft, on which this arrangement was employed, standing in a crowded position, the plan of letting it fall was inadmissible, and it had to be taken down from the top. The question was,—How to get the bricks down with as little damage as possible, so that they might be used again for building purposes? Owing to the position of the chimney, the bricks could not be thrown down outside; and, if thrown down inside, they would have been smashed, or if lowered by mechanical means, the process would have been very tedious. Under these circumstances, the question was considered whether the bricks could not be allowed to fall by their own gravity; but, at the same time, be cushioned sufficiently to break their fall and prevent damage. In order to do this, an air-tight iron box was placed at the bottom of the chimney; this box was fitted with an air-tight door, mounted on hinges, and closing on an india-rubber face, against which it was tightened by a wedge. A wooden spout was then fixed on the top of the box, and carried up to the top of the chimney; this spout was 3½ in. by 5 in. inside, and was made of planks 1½ in. thick, well nailed together, with a little white lead on the edges, thus making the spout perfectly air-tight. The spout was made in about 12-ft. lengths, and they were joined together by cast-iron sockets or shoes, and caulked round with tarred yarn, the whole apparatus costing about 6*l*. A few stays were put inside the chimney to keep the spout steady, and steps were nailed upon it by which the men could ascend. It will be seen that the whole of the spouting being perfectly air-tight, if a brick filled the spout perfectly, it would not descend; but, as the section of a brick is 3 in. by 4½ in., and the spout was 3½ in. by 5 in., there was a half-inch space each way, through which the air could pass the brick freely; this space further allowing for any irregularity in the size of the bricks. The result was, that the bricks, being partially cushioned in their fall, arrived at the bottom without any damage whatever. As soon as the box was full, the man at the bottom rapped on the spout as a signal to stop, and then opened the air-tight door and removed the bricks which had come down. This being done, he again shut the door, and signalled to the man on the top to go on again. The man on the top lowered his own scaffold, and as the spout got too high he cut a piece of with a saw. If there was much mortar adhering to the bricks, it was knocked off before putting the latter into the spout, and it was allowed, with any little pieces, to fall inside the chimney, and was wheeled out. The plan described is, I believe, quite new, and it is certainly most simple and ingenious. There are, no doubt, many circumstances under which it might be advantageously employed.

Straightening a Chimney by Pressure.—The foundation of a furnace-shaft in course of erection by M. Dubose, at Havre, had settled very irregularly, in consequence of the very unequal resistance of the soil, and so quickly that it was found impossible to complete it. The upper part had consequently to be taken down again, and the completion of the remaining 15 ft. had to be postponed until the chimney had been straightened. This latter operation was effected in the following manner:—The soil on the side opposite the sinking was removed to a breadth of about 4 ft. 6 in., and to the depth of the last stage of the foundation. Upon the lowest stage a number of piers leaning against the chimney-shaft were erected to the height of the ground-level, and the semicircular ditch thus formed was covered with radiating double T-beams, which were protected against sinking in the soil by a layer of sleepers, and rested on the piers. Planks were then laid on the beams, and about 30,000 bricks were put on them. This one-sided weighting of the foundation had the desired effect of bringing the shaft back to its perpendicular position, the movement within six weeks at the top being nearly 1 ft., so that a deviation from the perpendicular was then hardly noticeable.

Moving a Chimney.—In 1872, at the Cabot Mill, Brunswick, Me., a chimney, 78 ft. high, 7 ft. 9 in. square at the base, and 5 ft. 9 in. square at the top, containing upwards of 40,000 bricks, and weighing more than 100 tons, was moved 20 ft. to make room for the enlargement of the mill, on the plan of Benjamin Greene's. The work was done by a process similar to that by which ships are launched, the chimney being slidden along planed and greased planks. It was moved, the flues connected, and the fires started, in 8½ hours. The power used was two screw-jacks.

Mr. Bancroft's paper also included more or less fully-detailed descriptions of the following chimneys, viz.:—Woolwich Arsenal (239 ft. 9 in. high from foundations); wrought-iron chimney at Messrs. Schneider's Creusot Works (197 ft. high, riveted together horizontally and afterwards raised with a crane); wrought-iron chimney at Pittsburgh (1 ft. less in height, and raised in the same manner); Abbey Mills Pumping Station, Metropolitan Main Drainage (Sir Joseph Bazalgette, engineer); Royal Porcelain Works, Worcester (three); retort-house, South Metropolitan Gasworks, Old Kent-road (Mr. G. Livesey, engineer); a chimney at Boston, Lincolnshire (Mr. W. H. Wheeler, engineer); and the chimneys at Den's Works, Dundee. In describing the latter structures, Mr. Bancroft referred at some length to Mr. Carmichael's experiments on draught. We cannot, however, spare more space to the subject, contenting ourselves with giving the most salient items in the paper.

THREE INDIAN RAILWAY BRIDGES.

THE INSTITUTION OF CIVIL ENGINEERS.

AT the meeting on the 30th of April, Mr. Bateman, president, in the chair, the papers read were descriptive of three bridges on the Punjab Northern State Railway, viz.: "The Ravi Bridge," by Mr. R. T. Mallet; "The Alexandra Bridge, over the Chenab," by Mr. H. Lambert; and "The Jhelum Bridge," by Mr. F. M. Avern.

The bridge over the Ravi at Lahore consisted of thirty-three spans of 90 ft. in the clear, and 97 ft. 6 in. from centre to centre of the piers. The piers were of brickwork, each founded on three brick cylinders, sunk 70 ft. below the lowest water-level. Eight vertical tie-bars were built into the brickwork. The piers were protected from scour by concrete blocks thrown round them. The girders were of the parallel flange type. The lattice-bars formed two series of triangles, inclined at 45 degrees. The superstructure was designed to carry a footpath on the lower flange, and an asphalte cart roadway, flush with the railway, on the top. The cross-girders carrying the railway were suspended in stirrups from the upper flange. The first operation was the erection of a temporary wooden trestle-bridge, which was occasionally much damaged by floods, but was easily repaired. It served for material trains for four years. The bricks for the foundation cylinders were of three special forms. The lime was slightly hydraulic, and was made of the kunkur of the district. The mortar was composed of equal volumes of lime, brick-dust and fine river sand. The concrete was made of broken waste brick and 42 per cent. of unground mortar. The excavation of the cylinders was effected principally by Bull's dredgers. Cylinders of brick, 12 ft. 6in. in diameter, and of the same height, were sunk from 10 ft. to 12 ft.; then a similar length was added and sunk; next a length of 25 ft. was added, and sunk usually without weighting Finally, a length of 20 ft. was built, completing the 70 ft., which was sunk sometimes to 60 ft., when a load of 150 tons of rails commonly sufficed to complete the sinking. Among the tools used for excavating the material from the interior of the cylinders Fouracres' "spider" proved efficient. Whenever a cylinder showed a tendency to leave the perpendicular, it was corrected by shoring from the ground, and by passing a chain round, the two ends of which were anchored taut at a distance. Rails laid across the chain produced an efficient horizontal pull. The average progress with the large cylinders was 2 ft. a day of actual sinking. Half the girders were put together on the south bank, and half on the north, and they were carried into place by two travelling gantry cranes. The floating of the girders for the spans over the main channel of the river was accomplished by four native barges, on which timber staging was erected.

The Alexandra Bridge was 9,300 ft. long and 100 ft. deep. The first brick was laid on the 1st of November, 1871. The first train crossed the bridge on the 23rd of December, 1875; and it was opened on the 27th of January, 1876. In floods, the Chenab rose 11 ft. above low-water mark, and its width at Wuzerabad was 3½ miles. The mass of the water did not flow rapidly; but the main stream, corresponding to the fluctuating deep channel, rushed through with great velocity, in a serpentine direction. This was often nearly at right angles to the general course of the river when obstacles occurred. Under these circumstances the bed was driven before it. The depth of the main current was more than 50 ft., moving at a rate exceeding 10 miles an hour. The ground for about half the space of 3½ miles between the banks was composed of river deposit. On this a massive embankment had been raised, for several years, to carry the Grand Trunk Road as far as possible across the river-bed, the rest of the way being over temporary bridges of boats at the varying channels. During four months a ferry was established. A back channel, called the Pulkoo Nullah, flowed for several miles parallel to the main river, and in high flood their united waters submerged the intervening country. The effect of the embankment was to dam up the body of comparatively still water, forming the bulk of the river, and to divert the swift moving diagonal current against the crumbling shores. Hence the Pulkoo

developed into a deep navigable channel, 800 ft. wide. At Kuthola, on the northern shore of the Chenab, the river became wider by half a mile. The main current set against the proposed site of the northern abutment of the bridge, and the deepest water was close under the nearly vertical bank. The Trunk-road was gradually falling into the river, and a ferry had to be established at the Pulkoo. Thus, in the Wuzerabad Reach, the Chenab had become wide to an abnormal extent. The fine sand of the bed was ascertained to be about 65 ft. in depth, overlying clay of moderate consistency. The rapid current, moving from shore to shore, was likely not merely to attack the bridge piers in flank, but also to scour the ground from under them. Various works were undertaken to improve the site of the bridge. The first was to close the Wuzerabad navigable channel by an embankment three quarters of a mile long. A second embankment extended from the southern abutment of the bridge to the Pulkoo Nullah, to prevent the water of the river pouring into the Wuzerabad channel during floods. A third work deflected the stream at right angles to the general alignment of the railway in a direct line through the bridge. A fourth main work, being a star-shaped spur of trees and stones, was to prevent the river cutting behind the abutments in the event of disaster to the up-stream works. Several subsidiary works were executed of rough tree-spurs to catch floating sand, and to assist in turning the stream towards the centre of the river. The Chenab training works were carried out by September, 1872, at a cost of 4½ lakhs of rupees, and had since been maintained at a yearly cost of half a lakh of rupees. The first design for the bridge was, that it should consist of single well-piers 12 ft. 6 in. in external diameter, sunk 40 ft., and carrying lattice-girders under the rails, 97 ft. 6 in. in length from centre to centre of the piers. But the high floods of the rainy season of 1871 led to the adoption of Power's three-well system, and to the wells being sunk 70 ft. The piers were 35 ft. long, 8 ft. 8 in. thick, with semicircular ends, standing on similar basements 38 ft. long, supported on diminishing arches between the wells. Three were to be sunk 6 in. apart. The abutments were on fifteen wells, sunk to the same depth as the piers, and in two rows parallel to the central line. This change increased the quantity of brickwork originally proposed five or six times. At the close of the rainy season of 1871 the curbs of several of the piers were pitched. It was then determined to adopt Warren girders, and to have the rail-level at the bottom; also to have sixty-four spans, 142 ft. from centre to centre, and the bridge was thus commenced. The bridge over the Pulkoo back channel consisted of nine spans, 43 ft. 6 in. from centre to centre, with piers of single well cylinders sunk into the clay substratum underlying the river bed. The girders were of plate iron, carrying the rails on the top. On account of the great length of the Chenab Bridge two passing places were provided by widening the structure for two spans, and making it stronger. A concatenation of causes led to the current of the river running parallel with the bridge. Ultimately a deep trench was scoured out along the face of the bridge for more than a mile in length, resulting in the up-stream and centre wells of three of the piers toppling over from insufficiency of base. As the sites of three piers were blocked, so that fresh wells could not be sunk in the same place, two of the spans of the bridge were modified to suit the altered circumstances. The total cost of the bridge, including the training works, was 65 lakhs of rupees.

The Jhelum Bridge was situated on the line of the Grand Trunk road, the river being about 5,000 ft. wide. The bed was of sand, 15 ft. to 20 ft. deep, overlying a thick stratum of boulders and shingle. The fall of the bed was 1 ft. per mile, and the approximate discharge of the river at high flood was 200,000 cubic feet per second; the maximum recorded surface-velocity being 8·66 ft. per second. The length of the bridge was 4,875 ft. between the abutments, with training works on the left banks. There were fifty spans of 90 ft. each, giving forty-nine piers and two abutments. The right abutment and the three contiguous piers were founded in the boulder stratum. The foundations were brick cylinders, three in a line transverse to the bridge, a centre one, 12 ft. 6 in. in external diameter, and two flanking ones, each 10 ft. in diameter. The brickwork was built on a substantial wrought-iron curb, to which it was bonded by circular flat iron rings and vertical round-iron tie-rods. Three rings were introduced in the 32-ft. length of brickwork, at intervals of 10 ft., and the tie-rods, starting from the curb, went through the whole length of brickwork in the well. In the smaller wells there were eight rods, and nine in the larger wells. The rings were of flat iron, 3 ft. broad by $\frac{5}{16}$ in. thick. The brickwork of the smaller wells was 2 ft. thick; that of the larger wells was 3 ft. 3 in. thick. It was composed of specially-made radiating bricks, set in mortar consisting of one part of stone lime, two parts of kunkur, and six parts of fine brick-dust, the whole well ground together. The wells were successfully sunk through artificial islands. They were filled with concrete, and connected by small arches. The superstructure of the piers was 27 ft. 6 in. long, 7 ft. 6 in. wide, with semicircular cut-waters. They were carried up 21 ft. above low water. The abutments were founded on three wells, each 12 ft. 6 in. in diameter, and were similar to the piers, but flanked with longitudinal wing walls. Nearly nine wells were sunk per month. A spur of earth and boulders, 4,800 ft. in length, was made from the left abutment of the bridge to the high ground forming the left bank of the river, as a protection against the river getting in the rear of the bridge abutment. Moreover, an average amount of 13,467 cubic feet of boulders had been thrown round each of the piers. The boulders formed a local supply of material ready to be dropped into any holes scoured out around the piers, and gave support to the piers to resist the overturning action of the stream. The superstructure was composed of a pair of lattice-girders, connected on the top by an upper roadway of cross girders and rail-bearers, covered by buckle and flat plates, braced on their under sides. This upper roadway carried the railway and two footways. There was a lower roadway for foot-passengers and mules and ponies only. A detailed account was given of the girders and roadways, and of the erection of the girders. The total cost of the bridge, including the protective works, had been 139,502*l.*, or 28*l.* 11s. per lineal foot.

KEBLE COLLEGE, OXFORD.

THE new Dining-Hall and Library of Keble College, Oxford, were formally opened on the 25th ult.,—the anniversary of Keble's birth, the foundation-stone of the College having been laid just ten years previously by the late Archbishop of Canterbury. The chapel also was opened, and the foundation-stone of the Hall and Library laid, on the same day two years ago, by the Marquis of Salisbury, Chancellor of the University. The new buildings, which have been erected from the designs of Mr. Butterfield, architect, by Messrs. Parnell, of Rugby, comprise, besides the hall and library, common rooms, senior and junior, and a lecture-room. The style of the new buildings is in accordance with that of the rest of the college. The hall measures 127 ft. in length, by 35 ft. in breadth. The library is somewhat smaller. The common rooms and lecture-room are under the library. The kitchen with its offices and the buttery are of unusual size, since the system of common meals demands far greater accommodation than with the college arrangements which obtain elsewhere. The interior does not depend for its decoration upon the architect alone. Mr. Holman Hunt's picture, the "Light of the World," presented to the college by Mrs. Combe, is placed at the east end of the library. A portrait of Mr. Keble, by Mr. George Richmond, R.A., has also been presented by him to the college, and is placed over the "high table" in the hall. Portraits of Archbishop Longley, who laid the foundation-stone of the college on St. Mark's Day ten years since, and of the late Mr. W. Gibbs, the munificent donor of the chapel, by Mr. Ouless, after Boxall, as well as of the late Dr. Shirley, who took an active part in promoting the Keble Memorial Fund, are also placed in a group at the west end of the hall, imbedded in the wainscot panelling. The entire hall is surrounded with a low wainscoting. The windows contain medallion portraits of the founders of the several colleges, the arms of the See of Canterbury, the Diocese of Oxford, of the University, and of Mr. Gibbs; at the foot of the windows run mottoes selected from the Vulgate version of the Psalms. The only group of figures in the windows is that of the "Supper at Emmaus," in the upper tracery of the east window. The roof, of wagon-head form, is elaborately painted, and on one side of the hall is a minstrels' gallery. On issuing from the hall the visitor finds himself in an extremely lofty vestibule, on the other side of which lies the library, fitted up with reading recesses, lined with bookshelves, after the fashion of the Bodleian. Here is already a large collection of books,—Mr. Keble's,—Dr. Newman's presents, inscribed "*Amico suo dilectissimo Joannis Keble*," and those of other munificent benefactors, Lord Beauchamp, for instance, presenting the whole Bollandist collection of the Lives of the Saints. Facing the entrance are two lofty windows, containing appropriate mottoes from the Vulgate, and pictures respectively of the Tree of Knowledge and the Tree of Life. Under the window is Mr. Holman Hunt's picture before mentioned. The senior common room,—a very fine apartment,—is interesting as containing writing and other tables, the present of Canon Liddon, which were in constant use by the author of the "Christian Year." In the junior common room, which is for undergraduate use, the principal object is at present the portrait of the Warden, by Mr. Richmond. The whole of this costly pile of buildings has been presented to the college by benefactors who were, until the opening day, anonymous. At the luncheon, however, Mr. H. H. Gibbs announced that the donors were his cousins, Mr. Antony Gibbs and Mr. Martin Gibbs, sons of the late Mr. Antony Gibbs, of Tyntesfield, who gave the chapel.

Since the opening of the chapel in 1876 numerous other buildings have been completed in the same style as the earlier portions of the college. Additional sets of rooms have been built, giving in all accommodation for 140 students within the college walls, the principle of the place being intramural residence; and the Warden's lodgings, a large and handsome pile, has been erected at the south-east corner of the college, constituting one angle of a second quadrangle.

ALLEGED INSANITARY FLATS.

AT the meeting of the Metropolitan Board of Works on the 3rd inst., the Superintending Architect reported upon an application made by Messrs. Sutton & Dudley, builders, for permission to erect houses, in he new streets to be formed on the Surrey Gardens Estate, of a greater height than the width of the roads, recommending that the application be referred to the Building Act Committee for consideration and report. Mr. Selway said it was desired to erect the buildings in question 14 ft. higher than the width of the street. He felt it his duty to move, as an amendment, that the application be not granted. If the Board acceded to the application, they would be doing one of the very things which they were now promoting a Bill in Parliament to prevent. Mr. Fowler supported the motion for the adoption of the architect's recommendation. The applicants were the builders of Palatinate-buildings, in New Kent-road and Albany-road. Those buildings were arranged in flats, were exceedingly well constructed, of good materials, and the sanitary conditions were unimpeachable. It was proposed to erect buildings of the same character on the Surrey Gardens Estate. Mr. R. P. Taylor also supported the architect's recommendation, and said that the applicants ought to be encouraged rather than hindered in their enterprise. Mr. Selway, in reply, said he was quite aware of the kind of buildings proposed to be erected on the site in question. He had seen those already referred to, and more wretched buildings were not to be found in London,—he meant among new buildings. The area at the back of the buildings in New Kent-road was a mere well, into which no sunshine, and very little air, could ever enter. It was exceedingly undesirable that these enormous buildings should be carried up to such great heights. It was true that the buildings erected by the Peabody Trust and others were carried up to a great height, but where this was the case the streets were old thoroughfares, and the Board had no control over the height of the buildings there. In newly-laid-out streets, however, the Board would not be doing its duty did it sanction the violation of sanitary laws. The Board had to enforce an Act which said that all new streets should be 40 ft. wide, and that the houses should not exceed the width of the streets. The matter was referred to the Committee.

PARIS AND ITS EXHIBITION.

It is said that the French are good at a rush, but that when steady and dogged resolution is requisite, the English beat them hollow. A rush, a wonderful rush too, was made in the Exhibition buildings the night prior to the opening. We left it, at half-past seven on Tuesday evening, April 30th, very much in a state of chaos. We entered again after breakfast the followlng morning, and, lo and behold, the twenty long miles of corridors and avenues had all been swept and garnished. An army of 20,000 men had done this, and much else; for thousands of glass cases that had stood empty the night before were now stocked, all ready for presentation to the world at large. Lighted in part by the singularly beautiful electric light, and in part by ordinary lamps, the amount of work got through in the Exhibition during that one eventful night was simply astounding.

The greatest difficulty existed in gaining an entrance upon the morning of opening. Englishmen, however, were readily admitted at the Porte Decazes, opposite the British Commission Offices, in the Avenue de Suffren. The French police are a queer race, and, like the fair sex, do not reason; if, therefore, any Briton has in future any misunderstanding in getting into the building, with or without a ticket, let him resort to the Porte Decazes, where he will find the union-jack, flying at our Commission office close by, a singular incentive to the officials. The photographic season-tickets have, most of them, been dealt out to the various exhibitors. A French version of one's name is inscribed upon the back of each. This time they dub me "Hams Hems." In 1867 our friends rendered my patronymic "Darry Dems." I have the two tickets before me. They are precisely the same size, and are neither larger nor smaller than were the tickets at Vienna. At this latter Exhibition, however, no photographs were attached. At Philadelphia photographs were required, and the ticket took the form of a little book. Every day the Show was to be open was marked upon squares around this, and upon the entrance of the bearer the square corresponding with the date was punched through. Hence only one visit a day could be made with the season-ticket.

The opening ceremony at Paris was fairly imposing, but if there were *really* 80,000 soldiers present they made a very poor show. I should have guessed 20,000 at the most, and, being an old volunteer, I do not think I am much mistaken. Of the assembled princes, &c., our own Prince of Wales,—in scarlet coat and plumed cocked hat,—looked by far the best; and next to him the most imposing men were two Russian generals in white tunics, and golden helmets,—the latter crowned by double-headed eagles having outspread wings in the same metal. These birds were 7 in. or 8 in. high, and beautifully modelled. The *cortége* did not pass *through* the British Section, as nearly all the "dailies" have reported, but *by* it, and straight up the street of representative houses.

On the day of opening the French Restaurant raised its prices, and charged a franc (10d.) for each glass of beer. A great row ensued,—crockery and glasses were broken, tables overturned, and much clamour made. The waiters looked frightened, and the manager very pale. I think they were taught a lesson. At present there is only, so far as I am aware, one set of w.c.'s, and the charge for their use is 2½d. This, to those constantly at the Exhibition, is no inconsiderable item. The enclosed space being 2,000 yards or more long, and a third, perhaps, of that distance wide, locomotion becomes a serious thing. Hence ten pillar-boxes have been established at given points within the buildings; and collections are made every two hours by a staff of just a score of postmen.

It is in the Italian Court that some of the most beautiful work—artistically speaking—is to be found. Much of their marble sculpture is singularly full of grace and power, whilst samples of their wood-carving in walnut are unrivalled throughout the Exhibition. It is possible that some of it may be too delicate to come under the term of useful ornament, but it is, nevertheless, wondrously beautiful.

The Americans have brought some useful things over, and have capital little chariot-planes, which they can sell for about 6d. a-piece. These planes I know, from experience, to be superior to anything else of their class.

In the British section there is a large piece of carving in box-wood. It is called the "Helicon Fountain," and is an elaborate piece of workmanship of, perhaps, some 4 ft. high. It is not unlike a Chinese temple, and a card informs the visitor that it was made by a Scotch peasant. The villager in question is also present, and from him we learn that he took seven years over the work, and made it entirely with two old chisels and a pocket-knife. Had he, in the first place, spent a sovereign in procuring a dozen or two of proper carving tools, he would probably have completed his work in half the time, and saved three years and a-half of a valuable life. Had the man had any sort of art-training he might have become a second Stevens or a Godfrey Sykes. As it is, he prides himself upon originality, and that his work belongs to *no known style!*

The asphalte used by the French seems to have excellent setting powers, it is scarcely laid down ere it becomes perfectly hard, setting almost as quickly as plaster of Paris. The tram-rails, by which goods have been brought into the Exhibition, and the turn-tables, still remain in their respective positions. They are merely buried in a coating of cement, and, at the last day,—upon the close of the building,—will rise again for future use.

The Hôtel Dieu is now nearly complete, and in the finished portion there are now 500 beds occupied. We were glad to find, in a careful perambulation of the building, that none of our country-folk lay sick there. The wards have capital corridors for promenading in, these communicating with the court-yards by open arcading. The salles or wards themselves have oak parquet floors, and arched ceilings, the latter, with the walls, are whitewashed. The beds are four-posted, furnished with white curtains, and rather too close together. They average twenty-four in a ward. The fittings are all good. The patients' lockers are of polished oak, with marble tops. The kitchens are superb, and the cooking apparatus,—heated by hot-air or steam,—of very high character.

The decorations of the Sainte-Chapelle, close by, are, of course, finished; but the chapel does not seem to be used save as a show-place. There is neither altar, chairs, nor priest there.

Very good is much of the stonework in the city. Paris has rebuilt itself, and much of its masonry is excellent. The new Avenue de l'Opéra is nearly complete, and the scaffoldings have been mostly removed. There, as everywhere else, we find capital masonry and carving. If our London masons will only take a few days' trip to Paris this summer, they will laugh to scorn such of their leaders as in future may tell them foreign stonemasons cannot work. The four or five-ironed "talking" planes the French masons use are a characteristic feature. The irons project beyond the wood fully an inch, and their use is something between that of a saw and a drag, quite as much as it is that of a plane. It gets up fillets, &c., with great nicety and despatch. Bedding the stones merely, fixing, and then working them *in situ*, takes an immense deal of head labour from the foreman's shoulders, and, as no templets are required, must save a little fortune, in zinc alone, in the course of a year. The French joinery, as a rule, seems inferior to our own.

It really behoves every thoughtful workman to try his best to spend a week during the coming season in Paris. This need not cost him much, little more than being at home, and he will have a good opportunity thereby for judging fairly how we stand as a nation of workmen with the rest of the world. Of course,—

> "Our very eyes
> Are sometimes like our judgments, blind;"

but, after all, "seeing is believing," and although we may have little or no connexion with the house opposite, it may be as well to see what they can do in the shop "over the way."

HARRY HEMS.

Insanitary Property at Liverpool.—A Liverpool paper says,—"We understand that the Local Government Board have refused to grant a provisional order to the Corporation of Liverpool for the amendment of the Sanitary Act of 186[illegible] to enable them to deal with and demolish insanitary property more expeditiously than at present. We believe, however, the objection of the Local Government Board is more to the particular form in which the Council seek to obtain the powers than to the principle embodied in the request, and that application in another direction, if made, would be duly considered."

OBITUARY.

MR. W. MENZIES, the Deputy Surveyor of Windsor Park, died at his residence, near Virginia Water, on the 3rd of May. The Queen, who visited Mr. Menzies during his long and painful illness, has lost in him a valuable servant, whose constant endeavour was to do his duty and to serve her Majesty faithfully. Mr. Menzies was the architect of some model farms on the Royal Property (illustrated in a previous volume of the *Builder*), and published a book to which we drew attention at the time of its appearance.

THE WORK AT ST. ALBAN'S ABBEY.

SIR,—As I had an opportunity last week of seeing the work which has been done in moving the south wall of the nave of St. Alban's Abbey, and as there seems to have been some misapprehension as to the strains which would result from the force as applied to replace the wall in a perpendicular position, perhaps you will allow me to say a few words on the subject, from an engineer's point of view, and to make a remark or two on the manner in which, I think, the force might have been more advantageously applied.

In order to replace the south wall of the nave, which had receded, in its proper position, whole-balk struts have been used one against the top of each pier, and another row, parallel to them, at a higher level; there are intermediate timbers, but they only act as preventers. The lower row of struts, three in number, rest, as described in your report last week, on timber sills laid on concrete and against the foundations of the wall of the south aisle, and under the heel of each is placed a hydraulic jack. The head of each strut abuts against a whole-balk timber which is built into the wall to be moved, and through which all the force is applied. The upper row of struts is similar in position, the thrust being taken down to the ground outside the building, and the force applied by means of a hydraulic jack under the heel of each, placed at the level of the top of the wall of the south aisle. The distance between the two walls being small in comparison with the length of the struts, the thrust is more nearly vertical than horizontal, and the tendency is to raise the whole of the masonry above each timber, and the force being applied at the end of a beam built into the wall, tends to upset it inwards, *i.e.*, towards the north. This effect will be more marked in the case of the upper row of struts, as the weight of the superincumbent mass of masonry is there less. This action will account for the opening of the joints in the south side of the wall after the pressure had been applied; and when the struts are withdrawn great strain on the part of the wall at present borne by the timbers; and if the openings are only superficially made good with cement, which will not crush so easily as the stone, I should expect many courses to crack.

Besides the timber mentioned above as having been used for the purpose of forcing the wall back into its proper position, a perfect grove of struts has been applied to the south face of the north wall of the nave, to prevent its being drawn out of the perpendicular southwards, by the pull of the bolts which have been placed between the two walls, and screwed up as the hydraulic presses did their work. As the distance between the walls of the nave is much greater than that in the aisles, the slope of the struts is also greater, and their thrust more nearly horizontal; and I think the north wall thus strutted might with advantage have been made a *point d'appui* from which to pull, and the south wall could then have been brought into position without any of the injurious lifting action of which I have spoken; and the tendency to raise the north wall would have been slight in comparison, on account of the greater ratio of the struts, and whether this tendency would have been likely to be injurious would be a simple matter for calculation. The means by which I should have proposed to apply the necessary force, with hydraulic jacks placed at the heads of the struts in the nave, iron ties, vertical timbers outside the walls, and through bolts, as at present applied, would, I am afraid, take too long to describe, and be scarcely intelligible without drawings; but perhaps I have said enough to explain my meaning, and I trust that you may think my remarks on this successful work, although they take the form of criticism after the event, worthy of a place in your paper.

REGINALD E. MIDDLETON, C.E.

DISTRICT SURVEYORSHIPS.

METROPOLITAN BOARD OF WORKS.

At the meeting of the Metropolitan Board of Works on the 3rd inst., Mr. Vulliamy, the Superintending Architect, presented a report announcing the decease of Mr. Henry Baker, District Surveyor of St. Pancras. Mr. Furniss moved that the report be referred to the Building Act Committee, to consider and report as to the advisability of dividing the district. Mr. Watkins, in supporting the motion, said that the fees received last year by the District Surveyor amounted to 1,114*l.*, the average for the last three years being 947*l.* The district was therefore one which might advantageously be divided into at least two districts. The motion was agreed to, and a discussion then arose as to the appointment of a surveyor *ad interim*. By some members it was suggested that Mr. Frederick Wallen should be appointed, on the ground that he had been acting as "deputy" for Mr. Baker for some time past. Mr. Selway, however, moved that the usual course be adopted of placing the district *pro tem.* in the hands of the surveyor of the adjoining district, viz., Mr. Sedley. This having been seconded, Mr. Runtz said that Mr. Wallen had been performing the duties for some time past very satisfactorily, and he had been for some years before the Board as a candidate for a surveyorship. He therefore hoped that Mr. Wallen would be placed in charge of the district, at any rate for the present. Mr. Cufflin concurred, as it would look invidious, he thought, to oust Mr. Wallen from the performance of the duties which he had been ably fulfilling as the deputy of the late district surveyor. It was pointed out, however, by Mr. Selway and other members, that Mr. Wallen had not been acting as a deputy district surveyor recognised by the Board; that, in fact, he had simply been Mr. Baker's managing clerk in the district office, no doubt doing most of the responsible work, but owing responsibility to Mr. Baker, and not to the Board. In the end, Mr. Selway's motion was carried.

Mr. Vulliamy also presented a report on a letter from Mr. John Turner, district surveyor of East Islington, requesting the Board to extend the appointment of his son, Mr. J. Goldicutt Turner, as his deputy for a further period. Mr. Vulliamy recommended that permission be granted for a further period of six months. This recommendation gave rise to further discussion, in the course of which Mr. R. P. Taylor asked how long Mr. Turner's duties had been performed by deputy in this way? Mr. Vulliamy replied that it was since January, 1876. Mr. Taylor said it was high time some principle should be laid down as to how often, if at all, the appointment of a deputy *pro tem.* should be renewed. He moved that the subject be referred to the Building Act Committee, but subsequently, on the suggestion of Mr. Fowler, consented that the question should go to the Works Committee. Mr. Fowler said it was an important question whether, in the public interests, district surveyors, when unable to fulfil their duties in person, through physical or other disabilities, should not be compelled to resign, if unfit to continue their duties after an interval of six months. He was quite aware of the long and faithful service which Mr. Turner had rendered, but the Board, as a public body, must do its duty. Mr. Richardson thought that the adoption of any hard-and-fast rule would be productive of great hardship in certain cases. The motion to refer the question to the Works Committee was unanimously agreed to.

Mr. Vulliamy also submitted a letter which had been received from Mr. J. H. Good, district surveyor of Poplar, in which the writer said that failing health and increasing infirmities made it necessary for him to resign his appointment, which he had held for forty years. The average annual amount of fees received during the last three years Mr. Vulliamy reported to be 628*l.* 5s. 1d. As the district consists of two parishes, Bow and Poplar, and is a very large one, it was desirable, in Mr. Vulliamy's opinion, that the matter should be referred to the Building Act Committee, to consider the advisability of dividing the district. The chairman (Mr. Lowman Taylor) said, he thought it would be advisable for the Board not to accept the resignation for the present, as a serious accident had happened by the fall of a building in Mr. Good's district on the very day that he had sent in his resignation, and it was desirable to know, before entertaining the question of accepting the resignation, whether Mr. Good had been in any way remiss in the performance of his duties as district surveyor. It was agreed to refer the matter to the committee, and to defer acceptance of Mr. Good's resignation for the present.

THE SCHOOL BOARD AND SANITARY MATTERS.

THE "Laws of Health" are not in the syllabus of the School Board.

At the town of Hartland, in the county of Devon, there has for some time past been a very high death-rate from zymotic and preventible diseases. At the instigation of the Sanitary Authority, Dr. A. W. Blyth has inspected this spot in the warm county of Devon, and his report at once condemns the public school. He states that the closets open and ventilate into the rooms, and the drains empty into a cesspit about 24 ft. from the school-wall, and 22 ft. from the centre of the well, supplying the school with drinking and washing water.

The cesspit is ventilated into the school by means of an untrapped drain, running from the lavatory to the cesspit.

The whole class-room at the time of the inspector's visit was infected with a distinct sewage odour, and a stream of offensive gas was pouring into the lavatories, and the water behind was found to be polluted. In the school-yard the cesspit was covered with a loose stone slab, which any child might lift or kick away.

The inspecting doctor urges the Sanitary Authority to take immediate steps against the School Board authority to compel it to set its school in decent and healthy order.

RIVER PURIFICATION.

THE Corporation of Hertford have placed their works for the purification of the sewage of that town in the hands of the Rivers' Purification Association, who for an annual subsidy of 350*l.*, undertake the whole management of the place similarly to what they have done at Coventry, which place has been worked for some time by the Rivers Purification Association under a subsidy from the Corporation of Coventry.

Hertford is situated on the river Lea, whence the New River Company derives part of its supply. The average daily flow of sewage amounts to about 1,640,000 gallons, the population being 7,169. Waterclosets are in general use, and the sewage, which is very dilute, in consequence of leakage of subsoil waters into the sewers, also contains refuse from breweries. By an Act passed in 1854 the New River Company obtained powers to lay down intercepting main sewers through the town, to construct works for treating the sewage by the lime process, and to convey the effluent water past the New River head into the Lea, above the town of Ware. These sewage and outlet works cost the New River Company 28,000*l.*, and they pay the Corporation of Hertford 600*l.* a year to purify the sewage. For sixteen years, from 1858 until 1875, the lime process was used to purify the sewage, at a working cost of 410*l.* a year, and was then given up, as the Phosphate Sewage Company took a lease of the sewage works.

NEW ROMAN CATHOLIC LADIES' COLLEGE AT CAMBERWELL.

A LARGE new building designated the Ladies' College, is just on the point of completion, on a piece of land situated in Knatchbull-road, Camberwell, and immediately adjacent to the Roman Catholic Church of the Sacred Heart, Camberwell New-road. The building stands about the centre of a site nearly two acres in extent, and is inclosed by boundary walls 9 ft. high. It has four distinct elevations, but the principal frontages are those facing the west and the east, the first-named elevation containing the chief architectural features of the structure. It is 74 ft. in width, and 42 ft. in height to the cornice, with a gable at the south-west angle, carried to a height of 55 ft. It has three lofty stories, besides a deep basement. The materials are stock brick, with white Suffolk brick and Portland stone dressings. Internally the building is very spacious, and has accommodation for a large number of female pupils and students. The basement contains the refectory department, and all the domestic offices of the college. On the ground floor are two schoolrooms, each 17 ft. by 20 ft. These, with the chapel, are situated on the east side of this floor, the private apartments being on the west side, and divided from the schools and chapel by a corridor 5 ft. in width. The main area of the chapel is 16 ft. by 22 ft., apart from the chancel and altar space and an adjoining vestry.

Mr. C. A. Buckler, of Hereford-place, is the architect, and Mr. Kelly, of Windsor, the contractor.

MODEL PIPE LAYING.

THE *Consett Guardian* of the 3rd inst. states that at the last meeting of the Consett Local Board a report from the surveyor (Mr. Dixon) was read. According to the instructions received at the previous meeting, he had extended the drain at Rose Mount, and was surprised to find, on opening it out, that about twenty yards of it were entirely choked up. Before removing the deposit, he had levelled the drain, and found that it fell 6 in. *the wrong way* in twenty yards. He had relaid the drain at a proper level.

In the discussion which followed, it transpired that the drain had been laid by a former surveyor to the Board. If this can occur in the case of sewers laid down by a public body, supposed to possess properly-qualified officials, it is small wonder that complaints of defective private drainage are so rife in many towns, seeing that large numbers of the latter works are laid down without any pretence to competent design or supervision.

THE QUESTION OF OAK OR CHESTNUT IN BUILDING OPERATIONS.

THIRTY years ago my attention (practically) was brought to bear on this subject. I, with another, was sent from Cubitt's, Gray's-inn-road, in the spring of 1847, to Tenterden, in Kent; there, at the corner of the Rolvenden-road, stood the remains of what was part of a palace where Queen Elizabeth had resided, so tradition informed us, though at the time only about an eighth of what once was originally remained. We were sent to repair the carved oak panelling covering the walls from floor to ceiling. Necessarily this panelling, which had not been removed for ages apparently, was taken down. Behind it were, to all appearance, very solid and massive timbers, forming an interior partition next the hall; the main stanchions about 10 in. by 10 in., with double filling in studs, 4 in. by 5 in., all of chestnut (for so it turned out to be), but to all appearance like sound old English oak, unwrought. I individually, but accidentally, put the point of a screw-driver against one of the large upright timbers, and to my surprise it penetrated with ease the full depth, and when taken out the dust or decay came out most prodigiously, and on joint examination we found nothing but a thin crust from the plate above to the sill below,—all was completely perished inside. The sill below was of oak, and sound; the smaller timbers were not acted on to the same extent, except where the heart of the tree was forming part of the smaller scantlings, showing conclusively to my mind that the chestnut began to rot or decay at the heart, and if so, *query* from a worm or grub, but rather from some chemical action peculiar to the wood.

We had ample opportunity of comparing the two woods,—oak and chestnut,—and most probably they were of the same age. The difference was quite apparent; its texture and durability were for building purposes very inferior. The restoration had finally to be given up, the chestnut used in construction of framing timbers being in excess of oak; therefore the whole was pulled down, and a new mansion built on the site. I had as relics several of the best pieces I could collect, though small, but, unfortunately, I lost them by fire a few years ago; but having worked some of these relics myself, by carving and otherwise, I can testify to chestnut working easily any way of the grain, breaking off short, and being of a dead nature. Its appearance is much like oak when worked up, though in working and appearance an expert can easily tell the difference. To imitate it in graining the combing would be dispensed with; where the silver grain would be cut through on the bias it would show a long coarse streak, the other parts of a lighter colour, and works up very smooth and close-grained, polishing easily. I do not recollect any figure in any I come across like oak or wainscot.

In conclusion, I should think our ancient

brethren would know its properties, and would never use it in the construction of church roofs, or, indeed, for any purpose where durability would be a feature.

In America, the wood is of little worth. It grows large and quick, is very porous, and of a light colour. A great deal is used for fence-posts with its bark on; in short, any common purpose it is put to. The nut is very small indeed, and hardly worth the trouble to pick. For anything in building purposes I never saw it used, and I had over fifteen years' experience in that country. In short, there is no wood in the world for durability and strength to equal the English oak. T. H.

THE ARTISANS', LABOURERS', AND GENERAL DWELLINGS COMPANY, LIMITED.

SIR,—Some few months ago you commented upon my action as an auditor of the above company, and I shall esteem it a favour if you will kindly permit me to say that the official report of the recent annual meeting just issued to the shareholders is not a *verbatim* or fair record of what transpired on the occasion.

Several of the speeches have been "manipulated," and the numerous omissions, interpolations, and emendations are all made to my prejudice. But I will not trouble you with examples beyond the following.

Shareholders will at once recognise the importance of the omission from the speech of Mr. R. E. Farrant, one of the directors, of the following sentences:—

"I may add that it was a clearly understood thing yesterday at the Board—the Board having been riven, split in two on another matter—that we were to take our own course and our own position. That is some justification for Mr. Pearce in the course he has taken."

As the report does me an injustice, I trust you will find room for this brief communication.

JOHN PEARCE.

P.S.—I should be content to leave my case—even as presented in the report—in the hands of those having a knowledge of building, and shareholders could not do better than submit the points in dispute to some building friend.

*** Judging from the report of the proceedings at the meeting, Mr. Pearce appears to have had good grounds for animadversion; but in making an attack, at a public meeting of the shareholders, on his brother directors, without giving them proper and sufficient notice, he exposed himself to reproof.

BUCKINGHAM WATER-GATE.

SIR,—It may interest some of your readers to know that the landing-stairs between Charing Cross and Westminster Bridge were originally constructed as a site for this water-gate, but the price asked for it seemed so excessive that the purchase, I think fortunately, was not concluded.

The gate will be much more interesting and suggestive to future generations if allowed to remain where it is. Although to-day we can remember that the river ran up to its steps, in a few years—Somerset House alone excepted—every object indicative of the old condition of things will have disappeared, and it will be a matter of wonder. The gate will then become an eloquent landmark of the old foreshore; and as such, in addition to its being on its present site, the only memento of the old ducal gardens, should be one of the protected monuments of London.

In the contract for the embankment a sum of 90,000*l.* was included for providing statuary, &c., in terms of the original designs. This sum must evidently be still in hand, and should provide enough of imposing ornament without making it necessary to borrow old works, such as this water-gate. Its surroundings may be improved; but, beyond repair, the gate itself should remain untouched. M. M.

End of a Strike.—The journeymen slaters in Dundee, who had been locked out for two months, in consequence of their refusal to accept a reduction of wages from 8½d. to 8d. per hour, have intimated their willingness to resume their employment at the reduced rate of pay.

"THE PLAINT OF A POOR MECHANIC."

SIR,—With reference to the letter of your correspondent, will you allow me to say that I believe his statement is quite correct as to the rents charged at some buildings recently erected in Willow-street, Finsbury, but the buildings were not erected by "The Improved Industrial Dwellings Company (Limited)." This company, in 1868, built 168 improved dwellings in the same street, and the rents are from 5s. to 6s. 6d. per week for three rooms, and 7s. to 8s. for four rooms. J. MOORE, Secretary.

READING TOWN HALL COMPETITION.

SIR,—The letter [of "Fair Play," in your impression of the 27th ult., has reminded me that I am one of the unfortunate competitors whose design was not in "accordance with the requirements."

I have before objected to competitions upon principle, so that I must admit that what I have lost in time and money was well deserved. Several eminent architects competed, and what their feelings are at being thus played with will be better imagined than expressed.

About sixty designs were sent in, and after being considered by a "Building Committee," a limited number of these designs, instead of the whole, were submitted to Mr. Lainson, of Brighton. In what manner the latter gentleman fulfilled the trust imposed upon him, "Fair Play's" letter clearly demonstrates.

This matter should be investigated by the Institute, as suggested by "Fair Play." GRATIS.

CONTRACT TO SELL.

HUSSEY *v.* HORNE PAYNE.

THIS was an action (Court of Appeal) to enforce the specific performance of an alleged contract by the defendant to sell to the plaintiff an estate called the Mornington Estate, at Fulham, for 37,500*l.* In the letter which the plaintiff's agent wrote accepting the defendant's offer to sell were these words, "subject to the title being approved by our solicitors." The defendant demurred to the statement of claim, and Vice-Chancellor Malins overruled the demurrer. The defendant appealed.

Their Lordships allowed the demurrer upon a ground which was not taken before the Vice-Chancellor,—viz., that the words above quoted from the acceptance of the defendant's offer meant that the opinion of the plaintiff's solicitor as to the goodness of the defendant's title to the property was to be conclusive. This introduced a new term into the contract, and as the defendant had never assented to it there never was a binding contract.

It seems perfectly extraordinary to outsiders that Vice-Chancellor Malins should have overruled the demurrer when the letter relied on to establish a contract contained the words quoted above. The way in which decisions nowadays are given one week to be set aside the next is not creditable to our present system. Money enough has been wasted in the present case, but Mr. Hussey will probably go on to the House of Lords on the mere chance of, after all, finding a majority on his side.

ARCHITECTS' CERTIFICATES.

SPARROW *v.* HILL.

THIS was an action, in the Queen's Bench Division, to recover a balance on a builder's bill (tried at Nottingham at the last Assizes, before Lord Justice Bramwell), and it afforded a curious illustration of the present working of our judicial system. The question, as usual, was as to "extras." The tender accepted was for 569*l.*, and it was sworn on one side, though denied on the other, that the builder promised that he would leave it in the hands of the architect to say what should be due, which was agreed to. The architect considered the claim for extras, and allowed 600*l.*, which was paid into court. The builder claimed, however, nearly 500*l.* more, which was disputed on the ground that the architect had not certified for it. The Lord Justice, however, held that there really was not a particle of evidence to support the defence set up, and although, he said, some "ingenious person" might possibly think there was a scintilla of evidence of it, he did not think there was, and so, without leaving the question to the jury, he directed a verdict for the plaintiff for the amount claimed.

Mr. Metcalfe, Q.C. (with Mr. Graham), moved to set aside this verdict and for a new trial, on the ground that there was evidence to sustain the defence set up; and after some discussion,

The Court, being assured that the Lord Justice had withdrawn the case from the jury, and held that there was no evidence to support the defence, granted a *rule nisi* for a new trial. But if the rule is made absolute, and there is an appeal, it will go before the Court of Appeal, constituted of Lord Justice Bramwell and two other Judges.

Banquet at the Royal Academy.—On Saturday evening, the 4th inst., the president and council of the Royal Academy gave their anniversary banquet at Burlington House. Sir John Gilbert presided.

Books Received.

The Crace Collection. A Catalogue of Maps, Plans, and Views of London, Westminster, and Southwark. Collected and arranged by FREDERICK CRACE. Edited by his son, JOHN GREGORY CRACE. London: 38, Wigmore-street. 1878.

THE remarkable collection of views and maps illustrating the metropolis, made by the late Mr. Frederick Crace, is largely known amongst those who take special interest in such matters, but it was left to his son, Mr. J. G. Crace, to give the reading public some idea of its extent and value. The collection is the work of many years. The maps, plans, and views described in the catalogue are arranged in a series of fifty-seven portfolios of uniform size; besides these, there are eighteen large rollers with mounted maps and plans, three volumes of maps, and one volume of illustrations of frost fairs on the Thames.

The maps of London, commencing in 1560, form one continuous series, representing the gradual growth of this mighty city up to the year of the collector's death in 1859. Some of the maps are unique, and many of them are of great rarity. The earlier maps are bird's-eye views, giving representations of many of the principal buildings; some convey also much interesting information. Thus in Braun's map of 1572 (No. 13), republished in Belleforest's "Cosmography," London is described as "Ennoblie pour le commerce de plusieurs nations, bien peuplée de maisons, ornée de temples, magnifique en palais, illustrée pour les bons esprits y nouris." In the "Plan de la Ville de Londres" (No. 77), published 1700, it is stated, "État présent de Londres, 115,884 familles, 1,200,000 âmes;" and it adds that the yearly consumption of beer is 1,500,000 barrels, of oxen 67,000, of sheep 675,000. In the map No. 84, published 1724, the Customs duties of London are estimated at 300,000*l.* per annum; and it states that 800 hackney coaches are allowed to ply, giving the rates for hire of them. Various plans also represent important properties, such as the Greye Friars, St. Bartholomew's Priory and Hospital, Gresham College, the Bank, the Goring Estate where Buckingham Palace stands, Tart Hall, the Manor of Eburie, the Grosvenor Estates, the Bailiwick of St. James's, and the Pest-house Craven Hill Estate: the production of this last plan by the late Mr. Crace in the Court of Chancery, in 1858, is believed to have decided the question of the ownership of the property. The editor says the views of London are so numerous that, though many of them are of great interest, it is difficult to particularise them. He mentions, however, the *fac simile* copy of the view of London by Ant. Van Wyngaerde, now in the Bodleian Library, which is as valuable for its artistic merit as for its undoubtedly faithful representation of London about 1550. It is 10 ft. long and 17 in. high, and gives a most picturesque view of Southwark and London Bridge, with its towers and houses in the foreground, and a bird's-eye view of the whole City from Westminster to the Palace of Placentia, by Greenwich; St. Paul's is beautifully shown, with its tall spire. There are fine views of the City also by Vischer, 1620, by W. Hollar, 1647, by Kip, 1748, and by Buck, 1749, each of these being about 7 ft. long and 18 in. high, and all of them having the merit of truthful representation, for they corroborate each other.

Many of the drawn views are admirable for their artistic merit as well as for their antiquarian interest, such as those by W. Capon, P. Sandby, T. Sandby, R. B. Schnebbelie, Major Yates, J. Findlay, J. Buckler, G. Shepherd, and by T. H. Shepherd, whose water-colour drawings will be found by hundreds in this collection. In addition to the buildings, the views illustrate in many ways the habits of the people and occurrences of the time. The Great Fire of London, in 1666, is represented in many views by Hollar and others; the Water-works by London Bridge, fireworks on the river and in the parks, executions on Tower-hill and at Tyburn, and frost fairs on the Thames, will be found fully illustrated.

There are many views of Ranelagh and its masquerades of the last century, as well as of Vauxhall from its beginning to its close in our own time. In the grand view of St. James's Park, by Kip, 1710, are shown men playing at Pale Maille, so called by King James I., resembling our modern game of croquet; and in views

of entrance into London by Hyde Park Corner and Blackfriars Bridge, as well as of the Bank, dated 1800 to 1802, omnibuses will be seen on four, six, and eight wheels. The promenades on the Mall in St. James's Park illustrate the costumes of various periods from 1735 to 1800.

In forming the catalogue the editor has adopted the actual titles of the engraved maps and views, and has attached the dates where they can be found. He has also given the sizes of every drawing and print, the first dimension being the width, and the second the height of the plate, this last in some few cases including the title.

The late Mr. Crace, of whom we have a very agreeable remembrance, was born June 3, 1779. Following the profession of his father, he was extensively employed in the decoration of the royal palaces and of other important works. He married, in 1804, Augusta, daughter of Mr. John Gregory, J.P., of Chelsea, who was the Treasurer of the Whig Club and a friend of Charles James Fox. The editor may well be excused for saying,—"My father's kind and genial disposition gained him a large circle of friends, to whom his enthusiasm in the work, and the unceasing industry which he brought to bear in forming this collection, were well known. As it was the labour, so it was the solace of his latter days. As his collection increased, his love for it became all the stronger; and he worked at it without intermission, even through failing health, until, to use the words of Strype on old Stow, "prevented by sicknesse-bringing death," he "imparted not only his good intentions but best collections also unto me," and I have endeavoured thus "to perfect so well-deserving a work."

It was the desire of the elder Mr. Crace that the collection should remain unbroken, and be placed in some public institution, and this is also the desire of the present owner. It is to be hoped that the interesting and careful catalogue which he has prepared will speedily bring this about.

Miscellanea.

New Cemetery, Market Harborough.—The consecration of the chapel and the ground set apart for the burial of members of the Church of England, in the new cemetery at Market Harborough, took place on the 13th ult. The new cemetery, which is situated on the Northampton-road, about half a mile from the town, occupies two acres of ground, which originally cost 720*l*. Since coming into the hands of the Burial Board, the ground has been levelled and laid out at considerable expense, that portion facing the road being enclosed with a low brick wall, on the top of which is a strong iron palisading. The caretaker's lodge at the entrance and the two chapels are Gothic in style. Both the chapels are alike in the exterior and interior, each having a vestry. They are constructed of brick, with bands carried through to the interior, of brown stone from the Duston Quarries, Northampton. The windows are traceried, and of Bath stone. The roofs and seats are of best deal, varnished tables being placed at the east end of each chapel. The floors are of black and red quarries, and the tiles at the east end are from Willington, Shropshire. The architect was Mr. H. M. Townsend, of Peterborough, the contractor being Mr. Walter Lindley, of Leicester. The amount of the contract was 2,158*l*.

Libel.—George Edward Pearson, of Bury St. Edmunds, was again charged at Bow-street with libelling Sir Henry Arthur Hunt. The charge arose out of certain transactions between the firm of Kelk and Sir H. Hunt. The alleged libels were contained in letters written by the defendant, stating that Sir Henry Hunt had been bribed by Messrs. Kelk to obtain a contract for them. Sir John Kelk denied emphatically that there had been anything except perfectly regular dealings between Sir Henry Hunt and the firm. The defendant reserved his defence, and was committed for trial. A plea of insanity was raised.

Sewer Flushers.—At the meeting of the Metropolitan Board of Works, on the 3rd inst., it was resolved, on the motion of Mr. Fowler, "That a return be prepared of the number of men in the employ of the Board as flushers, and others in connexion with sewer works, who have been temporarily invalided during the past two years, and the amount paid in respect thereof."

Architects' Benevolent Society. — The Hon. Sec., Mr. J. Goldicutt Turner, writes:—"Sir,—In memoriam of the late Sir George Gilbert Scott I am cognisant of a donor to the funds of this Society of a sum of 26*l*. 5s., provided that not less than two others come forward with similar donations, the aggregate to be added to the stock invested in the names of the Society's trustees."

New Font, Gloucester Cathedral.—Mr. William Gibbs, of Tyntesfield, the well-known benefactor of Keble College, Oxford, died in April, 1875, at the age of eighty-five years. Among his many other good deeds, he had intended to offer a font for Gloucester Cathedral, and his son, knowing of this unfulfilled purpose, in October of that year offered to give the font as a memorial of his father. The late Sir Gilbert Scott accordingly prepared the design, the execution of which was entrusted to Messrs. Farmer & Brindley. The font has now been completed. It is to be placed at the west end of the south aisle, just inside the porch, and under the Elliott and Jenner memorial windows. The style of the structure is Norman. It will stand about 5½ ft. high. The base is about 7 ft. square, and rises in three steps, diminishing in size. The first two steps are fine-axed, and the third step, upon which the base of the font rests, as well as the font, is a redder variety of the same stone, polished, and is of a mottled red colour of a beautiful shade. From the top step at the corners spring four columns, with carved capitals, supporting the bowl above, which is about 3 ft. 6 in. square on the outside, with a circular interior. It has a carved ornamental base, and its four sides are enriched with carved panels, representing fish, Noah's Ark, a cross, &c

New Reredos, Long Sutton—A reredos has just been placed in the chancel of Long Sutton Church, from designs by Mr. W. Smith, architect, London. The centre consists of a representation of Our Saviour's administration of the Last Supper to his disciples, sculptured by J. Forsyth, London, on a slab of alabaster, 7 ft. wide and 3 ft. 6 in. high, having a gold background. On each side are richly-decorated pillars of Ancaster stone, surmounted by a canopy 12 ft. high, with pinnacles, crockets, and sculptured heads, the whole being supported by solid stone masonry 11 ft. wide. The stonework and the stone carving were undertaken by Messrs. Law & King, builders, &c., Lutterworth. Beyond, extending on either side about 4 ft. to the side walls of the chancel, a stone cornice surmounts a series of architectural designs, painted on Parian cement by Messrs. Heaton, Butler, & Bayne. The most striking objects are four full-length figures on gold grounds, illustrating the Mosaic and Christian dispensations. The Old Testament is represented by Kings David and Solomon; the New by St. Peter and St. Paul. Under each pair of figures is a geometrical dado, embellished with vine foliage and divers coloured borders.

New Barracks, Montrose.—The *Montrose Review* understands that Messrs. Ford & Son, builders, have completed a contract with the War Department for the whole work in connexion with the transformation of the Old Asylum Buildings into barracks for the militia. The alterations on the present buildings will be very extensive. The greater part of the interior will be gutted, and a new range of offices will be erected between the present building and Panmure Barracks. The grounds within the inclosed walls are in the meantime divided by stone dykes, the whole of which are to be removed, and by this means the barracks will be surrounded by a large open space. When the alterations are completed there will be accommodation for at least 550 men. Messrs. Ford have just completed the erection of the new hospital, Cameron and Murray wings, of the barracks at Perth, at a cost of 17,000*l*.

Monument to an Editor. —The sum of 2,078*l*. has been received for a memorial to the late Mr. Alexander Russell, long editor of the *Scotsman*. At a meeting of the committee in charge of the matter on the 10th ult., it was unanimously resolved to erect in the Dean Cemetery, Edinburgh, where the remains of Mr. Russell are interred, a monumental obelisk of polished red granite 35 ft. 8 in. in height, from a design furnished by Alexander Macdonald, Field, & Co., Aberdeen.

Proposed Large Church for the Oratorians, South Kensington.—Designs have been submitted by Mr. Hansom, Messrs. Goldie & Child, Mr. Fowler, Mr. Walford, and others.

Fall of a House.—An accident occurred on the 2nd instant in Vesey-street, Poplar. It appears that for some time past a row of houses at one end of Vesey-street has been undergoing the process of partial rebuilding, in addition to which an addition has been erected at the back of the houses, intended to give three extra rooms to each house. About five o'clock the new erection at the back of one of the houses came down with a crash, pulling a portion of the old structure with it, and so greatly shaking the adjoining tenements on either side, that they appear likely to fall also.

Kidderminster School of Art.—A meeting has been held in the Mayor's parlour, Kidderminster, for the purpose of considering the revised plans and taking into consideration the necessary steps for the erection of a School of Art at as early a date as possible. Mr. Brinton said that the sum of 3,000*l*. would be required to carry out the whole of the works. He concluded by moving the adoption of the plans prepared by Mr. Gethin. The motion was unanimously agreed to.

Mr. P. Le Neve Foster.—A committee is in course of formation for the purpose of raising a sum of money to be presented to Mr. P. Le Neve Foster as a testimonial in recognition of his twenty years' efficient services at the Society of Arts. We wish it every success.

The Rebuilding of the Tuileries. — The Tuileries Commission has resolved to recommend the restoration of the ruined palace, at a cost of about 4,000,000 francs, and the appropriation of it as a museum of modern art. The Chamber will be asked to sanction the scheme.

The Bridgewater School Board, on Saturday last, adopted plans for new schools to be built in Albert-street for the accommodation of 720 children, prepared by Mr. Parker, the borough surveyor.

TENDERS

For works at the School for Imbecile Children, Darenth, Kent, for the Managers of the Metropolitan Asylum District. Messrs. A. & C. Harston, architects:—

Road-making and Ground Work.

Wipe	£7,355	0	0
Blake	6,990	0	0
Bell	6,880	0	0
Perry	6,582	0	0
Young & Williams	5,566	0	0
Webster	4,637	0	0
Goddard	4,180	0	0
Paice	3,397	0	0
Brady	2,983	0	0
Nicholson (accepted)	2,670	0	0

Farm Buildings.

Webster	£7,500	0	0
Blake	7,490	0	0
Wall	6,662	0	0
Prout	6,135	0	0
Cowland	5,984	0	0
Kirk (accepted)	5,960	0	0

Turret Clock.

Moore Bros. (accepted)	£300	0	0

Oak Fencing.

White & Co.	£1,369	13	0
Taylor & Brooker	1,350	0	0
Stenning & Co.	1,335	0	0
Key (accepted)	1,225	0	0

For engine and boiler house, shaft, &c., at East Farleigh, East Kent, for the Maidstone Water Works Company. Mr. Henry Teague, engineer:—

Bowes	£3,990	0	0
Cox	3,680	0	0
Wilkins	3,672	0	0
Bridge	3,556	0	0
Wallace & Clements (accepted)	3,554	0	0
Avard	3,505	0	0
Ames	3,316	6	9
Miklejohn (withdrawn)	3,120	0	0

For county bridge, Southend-lane, Beckenham, for the Justices of the County of Kent. Mr. Martin Bulmer, architect:—

Payne & Balding	£449	0	0
Ames	434	10	6
Jerrard	385	0	0
Landsbury (accepted)	362	0	0

For two shops to be erected over the forecourts of 96 and 98, Newington-butts, also various alterations. Mr. E. Taylor, architect:—

Smith (accepted)	£315	0	0

For house and factory, Salway-road, Stratford, for Mr. S. Flaxman. Mr. Geo. More, surveyor:—

Reed	£975	0	0
Hoskings Bros.	823	0	0
Gregor	815	0	0
Charlton & Mansell	700	0	0

For master's house, in Church-street, Lower Edmonton, for the Trustees of Latymer's Charity. Mr. E. Ellis, architect:—

Linzell	£789	0	0
Field & Sons	776	0	0
Humphreys	738	0	0
Ward	692	0	0

For new dining-hall, restaurant, &c., to the Cliftonville Hotel, Margate. Mr. Alfred Drowe, architect. Quantities by Messrs. Bull:—

Naylar	£3,270 0 0
Bushell & Sons	5,216 0 0
Paramor & Son	5,100 0 0
Wilson	4,990 0 0
Brown & Son	4,716 0 0
Mark	4,696 0 0
Denne	4,250 0 0

For Primitive Methodist Chapel, Battersea-fields. Mr. A. J. Rouse, architect:—

Stubbs	£3,179 0 0
Storr	3,120 0 0
Ford	3,032 4 0
Williams	2,965 19 9
Parker & Evans	2,673 0 0
Coles	2,615 0 0
Blow	2,540 0 0
Steed Bros.	2,532 0 0
Garrud	2,483 0 0
Newton & Triggs	2,465 0 0
Sawyer	2,371 10 0
Lathey Bros.	2,330 0 0
Sampson & Parrish	2,250 0 0
Hocking	2,248 0 0
Holloway	2,217 0 0

For the extension of Slater's-street Primitive Methodist Chapel and school, High Wycombe. Mr. A. J. Rouse, architect:—

Pierce	£446 12 7
Harris	442 9 0
Hunt	429 15 0
Salt	295 0 0

For the erection of six houses and shops, at Coseley, in the parish of Sedgley, for Mr. S. R. Smith. Mr. Charles Round, architect:—

Exors. of Millward	£1,855 6 0
Nicklin	1,621 0 0
Rawlins	1,515 10 0
Burton	1,353 0 0
Adams	1,320 10 0
Jones & Sons	1,250 0 0
Tranter (accepted)	1,134 8 0

For the erection of three chapels, three lodges, and mortuary-house, in Everton Cemetery, Liverpool. Messrs. T. D. Barry & Son, architects. Quantities supplied:—

Urmson	£21,812 0 0
Roberts	21,800 0 0
Wells & Sons	21,500 0 0
Morrison & Sons	20,612 0 0
Jones	20,360 0 0
Black & Toul	20,333 0 0
Brown & Backhouse	20,090 0 0
Thornton & Son	19,812 0 0
Nicholson & Ayre	19,663 0 0
Miller	19,620 0 0
Yates	19,583 0 0
Anwell*	19,555 16 7

* Accepted, subject to arrangement.

For the erection of schools and master's residence, at Tipton-green, for the Tipton School Board. Mr. Charles Round, architect. Quantities supplied:—

Rowley & Lynex	£7,146 8 11
Exors. of Millward	6,917 11 0
Everal	6,643 0 0
Exors. of Cresswell	6,513 0 0
Harley	6,229 2 6
Dawson & Bradney	6,142 0 0
Webb & Round	5,940 0 0
Nelson	5,803 0 0
Holland & Sons	5,642 0 0
Jones & Sons	5,622 0 0
Tranter	5,446 0 0
Stockton & Son	5,098 0 0
Horton	5,079 0 0
Adams (accepted)	4,928 10 0

For the erection of schools and master's residence, at Burnt Tree, for the Tipton School Board. Mr. Charles Round, architect. Quantities suppied:—

Love & Flint	£5,812 17 3
Rowley & Lynex	4,945 15 7
Everal	4,633 0 0
Exors. of Cresswell	4,530 0 0
Harley	4,409 18 10
Dawson & Bradney	4,339 0 0
Jones & Sons	4,190 0 0
Nelson	4,155 0 0
Webb & Round	4,132 10 0
Holland & Sons	4,103 0 0
Exors. of Millward	3,917 1 4
Stockton & Sons	3,780 0 0
Tranter	3,668 0 0
Horton	3,648 0 0
Adams (accepted)	3,371 0 0

For construction of outfall sewage works, &c., Northwich. Mr. Henry Bancroft, engineer:—

Hooson	£3,445 4 6
Bennison	3,439 0 0
Keegan	3,397 7 0
Whittle	3,333 14 0½
McGuire	3,200 0 0
Dale	3,199 0 0
Winnard	3,163 2 1
Stafford & Co.	3,125 18 4
Leicester Bros.	2,986 0 0
Mackey	2,960 13 10
G. & J. Foote	2,710 13 1
Hirst	2,685 15 6
Cowdery & Sons	2,681 12 6
Kirk (accepted)	2,667 0 0
Rayner	2,524 7 0

For master's residence, St. Mark's School, Windsor. Mr. Stephen Wyborn, architect:—

Norris	£4,447 0 0
Potbury	4,010 0 0
Woodbridge	3,977 0 0
Hollis	3,791 0 0
Reavell (accepted)	3,771 0 0

For new Wesleyan Chapel, Broad-street, Ludlow, Salop. Mr. Ranger, architect:—

Grosvenor	£2,000 0 0
Jones & Co.	1,989 0 0
Hine	1,900 0 0
Gethin Bros.	1,796 0 0
Nevitt Bros.*	1,550 0 0

* Accepted, exclusive of old materials, valued at 500*l*.

For construction of river-wall, shedding, and boundary-walls, &c., at the Vestry-wharf, No. 2, Lot's-road, Chelsea, for the Vestry of the said Parish. Mr. G. H. Stayton, engineer:—

Braid & Co.	£1,475 0 0
Thorn	1,450 0 0
Newell & Robson	1,450 0 0
Cook & Co.	1,350 0 0
Brass	1,328 0 0
Young & Co.	1,299 0 0
Neave & Son	1,285 0 0
Crockett	1,200 0 0
Cardus	1,190 0 0
Dickenson (accepted)	1,146 0 0

For formation of new streets, Burslem. Mr. Ralph Dain, architect:—

Trubshaw	£1,730 0 0
Mackay	1,591 0 0
Worthington & Hill	1,530 0 0
Smith	1,454 0 0
Brindley	1,403 0 0
Noden & Wilding	1,359 0 0
Dovener & Quesnet	1,324 0 0
Drewitt & Pickering (accepted)	1,305 0 0
Boughey	1,182 0 0

For the restoration of Castle-ffrome Church, near Bromyard, Herefordshire. Mr. M. B. Buckle, architect:—

Smith	£1,332 0 0
Barrett	1,096 0 0
Porter (accepted)	894 0 0

For additions to Storridge Schools, near Malvern, Herefordshire. Mr. M. B. Buckle, architect:—

Porter	£131 0 0

For the erection of residence and farm buildings, at Manor-court Farm, Brasted, Kent, for the Earl Stanhope. Mr. Martin Bulmer, architect:—

Ashby & Horner	£4,440 0 0
Durtnell	4,244 0 0
Callend (accepted)	4,200 0 0

For five houses and shops, at Stamford-hill. Messrs. Wm. Waymouth & Son, architects:—

Dover Bros.	£6,117 19 0
Wyeth	5,030 0 0
Sawyer	4,989 0 0
Sheffield & Prebble	4,987 0 0
Shurmur	4,977 0 0

For rebuilding house, at Walthamstow, for Mr. David McLean. Mr. William Kidner, architect. Quantities by Mr. H. Blackwell:—

Larter & Son	£3,844 0 0
Shurmur	3,825 0 0
Ashby & Horner	3,770 0 0
Browne & Robinson	3,769 0 0
Lawrence	3,755 0 0
Staines & Son	3,746 0 0
Morter	3,643 0 0
Conder	3,620 0 0
Garrud	3,473 0 0

For proposed residence and chapel, for the Brotherhood, Randolph-gardens, Kilburn. Mr. F. W. Hunt, architect:—

	Residence.	Chapel.
Harris	£4,303 0 0	£1,332 0 0
Simpson	4,096 0 0	1,225 0 0
Towns	3,950 0 0	1,200 0 0
Laley Bros.	3,796 0 0	1,174 0 0
Phillips & Briscoe	3,691 0 0	1,145 0 0
Bailey	3,542 0 0	1,085 0 0
Tileman	3,441 0 0	1,108 0 0
Haylock	3,455 0 0	1,073 0 0

TO CORRESPONDENTS.

J. P.—W. H. J.—M. B.—J. P.—J. S. H.—H. S.—R. U. R.—A. D.—H. D.—C. R.—G. & V.—B. T.—J. P.—Dr. A.—B.—W. R.—E. P. L. B.—A. & C. H.—J. G. B.—L. P. & B.—J. K.—J. R.—M. B. B.—R. L.—S. W.—T. C.—R. K.—H. G. T.—T. P. W.—W. R. D.—J. B. & Son.—C. H.—J. H. W. (diagram referred to appeared first in the *Builder*. We do not observe anything new in the diagrams sent).—J. K. (we should be glad to receive the particulars offered as to the Embankment).—J. S. (send plans and particulars).—G. & M. (should send list of tenders and amounts).—T. B. (next week).—H. S. S. (next week).—O. R. (next week).—G. E. C. (too late for this week).

All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication.

NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

CHARGES FOR ADVERTISEMENTS.

SITUATIONS VACANT, PARTNERSHIPS, APPRENTICESHIPS, TRADE, AND GENERAL ADVERTISEMENTS.

Six lines (about fifty words) or under ..... 4s. 6d.
Each additional line (about ten words) ..... 0s. 6d.

Terms for series of Trade Advertisements, also for Special Advertisements on front page, Competitions, Contracts, Sales by Auction, &c. may be obtained on application to the Publisher.

SITUATIONS WANTED.

FOUR Lines (about THIRTY words) or under ..... 2s. 6d.
Each additional line (about ten words) ..... 0s. 6d.

REPLIES TO ADVERTISEMENTS,

Addressed Box ——, Office of "The Builder,"

Cannot be forwarded, but *must* in all cases be *called for*, and the Office Receipt produced.

THE CHARGE FOR A BOX IS AS UNDER:—

For "Situations Wanted" Advertisements ..... 3d. per Week.
For all other Advertisements ..... 6d. per Week.

PREPAYMENT IS ABSOLUTELY NECESSARY.

*** Stamps *must not* be sent, but all small sums should be remitted by Money Order, payable at the Post-office, King-street, Covent-garden, W.C. to DOUGLAS FOURDRINIER, Publisher, addressed to No. 46, Catherine-street, W.C.

Advertisements for the current week's issue must reach the office before THREE o'clock p.m. on THURSDAY.

The Publisher cannot be responsible for TESTIMONIALS left at the Office in reply to Advertisements, and strongly recommends that COPIES ONLY should be sent.

TERMS OF SUBSCRIPTION.

"THE BUILDER" is supplied *direct* from the Office to residents in any part of the United Kingdom at the rate of 19s. per annum, *prepaid*. Remittances payable as above.

Bath Stone of Best Quality.
RANDELL, SAUNDERS, & CO. (Limited), Quarrymen and Stone Merchants.
List of Prices at the Quarries and Depôts; also cost of transit to any part of the Kingdom, on application to
Bath Stone Office, Corsham, Wilts. [Advt.]

Asphalte.
Seyssel, Patent Metallic Lava, and White Asphaltes.
M. STODART & CO.
Office:
No. 90, Cannon-street, E.C. [ADVT.]

Asphalte.—The Seyssel and Metallic Lava Asphalte Company (Mr. H. Glenn), Office, 38, Poultry, E.C.—The best and cheapest materials for damp courses, railway arches, warehouse floors, flat roofs, stables, cow-sheds and milk-rooms, granaries, tun-rooms, and terraces. [ADVT.]

Whitland Abbey Green Slates.—These slates are of a grey green tint, are stout, and made in all sizes. A large stock available for immediate delivery.—For further particulars, apply to MANAGER, Clynderwen, R.S.O., Carmarthenshire. [ADVT.]

CHAPPUIS' PATENTS

FOR

REFLECTING LIGHT.—DAYLIGHT REFLECTORS

OF EVERY DESCRIPTION, ALSO

ARTIFICIAL LIGHT REFLECTORS.

P. E. CHAPPUIS, Patentee. Factory, 69, Fleet-st. London, E.C.

N.B.—DIAGRAMS AND PROSPECTUSES ON APPLICATION.